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YOUR SPECTRUM

No.16 July 95p *Byte High, No Limit*



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YOUR BASIC

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- **BLAST!** is the first fully compatible OPTIMISING BASIC COMPILER for the Sinclair ZX Spectrum and Spectrum +.
- **BLAST!** will compile ANY BASIC program, without alteration.
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Using **BLAST!** couldn't be simpler. Just load it with your BASIC program and press "C" to compile. In a few seconds the compiled program is ready. Just type RUN and see your software run up to forty times faster.

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BLAST! doesn't just compile your programs; it also applies a range of sophisticated optimisation techniques to enhance the performance of the compiled code.
Any program can be compiled without alteration, but we think you will enjoy the wide range of extensions to BASIC built into **BLAST!**
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BLAST! provides the complete BASIC programmer's package. As well as a sophisticated compiler **BLAST!** includes a comprehensive toolkit with a full range of features including renumber, single-step, search and replace, and block handling operations. Use it to test and develop your BASIC programs before compiling them with **BLAST!**

STOP PRESS — OXFORD PASCAL

OXFORD PASCAL is now available for the SPECTRUM as well as the C64 and the BBC 'B'. To call us for details dial 100 and ask for FREEPHONE PASCAL.

Price/availability matrix		SPECTRUM	C64	BBC 'B'
BLAST BASIC		£24.95	N/A	N/A
OXFORD PASCAL	DISK	N/A	£49.95	£49.95
	CASSETTE	£24.95	£22.95	£39.95

All prices are inclusive of VAT
Please add £2.00 for postage and packing.

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My computer is SPECTRUM ☐ BBC ☐ 64 ☐ Please supply CASSETTE ☐ DISK ☐

I enclose £.................. including £2.00 p&p Please make cheques payable to OCSS Ltd.

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Telephone (0993) 812700 Telex 83147 Ref. OCSL

CUT THE COUPONS *CUT THE COST*

Pssst — d'you wanna buy a printer? What about a joystick and interface? Or a new game? Or a keyboard? Or ... Well, now's the time to go for it! With these YS value added vouchers you can save up to £110. And that's why we're shouting about this great budget bonanza. Start sending off the vouchers now and save £££s on a mega Speccy spending spree.

Grab 5 Free Rolls of Printer Paper when you buy an *Alphacom 32* Printer at

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You can save £££s with these great value YS vouchers. Here's how: Fill in the back of the voucher relevant to the product you want to purchase and make sure you've ticked the right one. Then clip it out and on a clean sheet of paper, write your name and address in BLOCK CAPITALS. As a double check it's worth writing the same information on the back of all cheques.

All *YS* Supersaver vouchers should be sent directly to the companies unless otherwise stated on the back of the voucher. Each envelope should contain a voucher, payment (either a cheque or a Postal Order) and your address on a separate sheet of paper.

Please do not post anything to *Your Spectrum* — we cannot deal with your orders here.

MANCOMP VOUCHER

Please read the section called How to Order.

	MRP	OUR PRICE	SAVE
☐ Mancomp MO184 Keyboard	£49.95	£35.00	£14.95

Prices include Vat and P&P.
Please rush me my Mancomp MO184 Keyboard. I enclose a *cheque/Postal Order for £37.95 made payable to Mancomp Ltd.

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Now send your order, payment and your address to Mancomp Ltd, Dept YS, Printworks Lane, Levenshire, Manchester M19 3JP.

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☐ The Interface III	£39.95	£37.95	£2.00

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Please rush me my Interface III. I enclose a *cheque/Postal Order for £37.95 made payable to Evesham Micro Centre.

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☐ *The Quill*	£14.95	£12.95	£2.00
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Prices include Vat and P&P.
Please send me the products I've ticked. I enclose a *cheque/Postal Order for £.......... made payable to Gilsoft.

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Now send your order, payment and your address to Gilsoft, 30 Hawthorn Road, Barry, South Glamorgan.

RAM VOUCHER

Just tick the box next to the product you want to order and then read the section called How to Order.

	MRP	OUR PRICE	SAVE
☐ The Ram Turbo Inter face + The Quickshot II Joystick	£33.00	£30.00	£3.00

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Now send your order, payment and your address to Ram Electronics (Fleet) Ltd, (Dept YS), 106 Fleet Road, Fleet, Hampshire GU13 8PA.

TRANSFORM VOUCHER

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☐ Transform New Keyboard	£79.95	£74.95	£5.00

Prices include Vat and P&P.
Please rush me my new keyboard. I enclose a *cheque/Postal Order for £74.95 made payable to Transform Ltd.

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Now send your order, payment and your address to Transform Ltd, Dept YS, 24 West Oak, Beckenham, Kent BR7 2EZ.

FLOYD VOUCHER

Order a Floyd 40 printer with this voucher and you'll receive 2 FREE rolls of printer paper worth £5. Please read the section called How to Order.

Please rush me my Floyd 40 printer and 2 free rolls of paper. I enclose a *cheque/Postal Order for £69.95 plus £4.95 P&P, made payable to Floyd.

*Please delete as applicable
Now send your order, payment and your address to Floyd, PO Box 76, Plymouth, Devon P41 1S2. This offer ends July 31st 1985.

W H Smith VOUCHER

When you buy an Alphacom 32 Printer at your local W H Smith Computer Department this voucher entitles you to a free five pack of black printer paper (worth £6.99). This offer is subject to availability.

All prices are correct at the time of going to press. Access/Barclaycard are accepted.
Offer ends Saturday 3rd August 1985.

DK'TRONICS VOUCHER

Just tick the box next to the product you want to order and then read the section called How to Order.

PRODUCT	MRP	OUR PRICE	SAVE
☐ Spectrum/ZX81 keyboard	£37.50	£33.75	£3.75
☐ Programmable interface	£22.95	£20.50	£2.45
☐ Dual Port interface	£13.00	£11.00	£2.00
☐ Light Pen	£19.95	£17.95	£2.00
☐ Centronics interface	£39.95	£35.95	£4.00
☐ 3 Channel Sound Synth	£29.95	£26.95	£3.00
☐ Games Player	£12.95	£11.65	£1.30
☐ Currah MicroSpeech	£35.50	£23.50	£12.00
☐ Currah MicroSlot	£8.95	£5.95	£3.00
☐ Currah TV Sound Amp+ Slot	£15.90	£10.50	£5.40

Prices include VAT and P&P.
Please send me the products I've ticked. I enclose a *cheque/Postal Order for £........... made payable to Dk'tronics Ltd.

Now send your order, payment and your address to Dk'tronics, Unit 6, Shire Hill Industrial Estate, Saffron Walden, Essex CB11 3AQ.

COMMOTION VOUCHER

Just tick the box next to the product you want to order and then read the section called How to Order.

	MRP	OUR PRICE	SAVE
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☐ The Avoider	£29.95	£26.95	£3.00
☐ The Peppy	£16.95	£14.95	£2.00
☐ The Medusa	£17.95	£14.95	£3.00
☐ The Navis	£29.95	£26.95	£3.00
☐ The Beasty 8 Channel Infra-red Controlled System	£49.95	£44.95	£5.00

Prices include Vat and P&P.

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CASCADE VOUCHER

Just tick the box next to the product you want to order and then read the section called How to Order.

	MRP	OUR PRICE	SAVE
☐ The Life of Harry	£6.95	£5.45	£1.50
☐ Game Cassette 4	£6.95	£5.45	£1.50
☐ The Game Cassette 50	£9.95	£8.45	£1.50

Prices include Vat and P&P.
Please send me the products I've ticked. I enclose a *cheque/Postal Order for £.......... made payable to Cascade Games Ltd.

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Now send your order, payment and your address to Cascade Games Ltd, 1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5BG.

INSIDE YS

MEGAGAME



32

Firefighters Beyond's *Shadowfire* is blazing a new trail. Join the *YS* firing squad — and play with *'fire.*

HARDWARE

Disko-Tech Full road-tests of two mini disk drives. The Opus Discovery and the Triton QD are the newest Speccy spin-offs.

24



GAMES



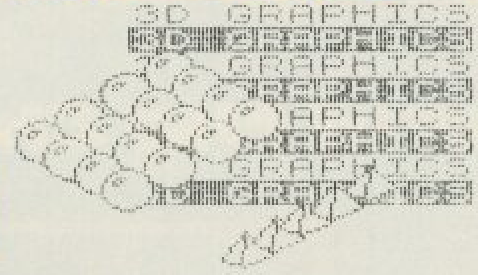
16

Go for Gold Join the gold rush for medals in the great *YS* hi-score chart challenge!

37

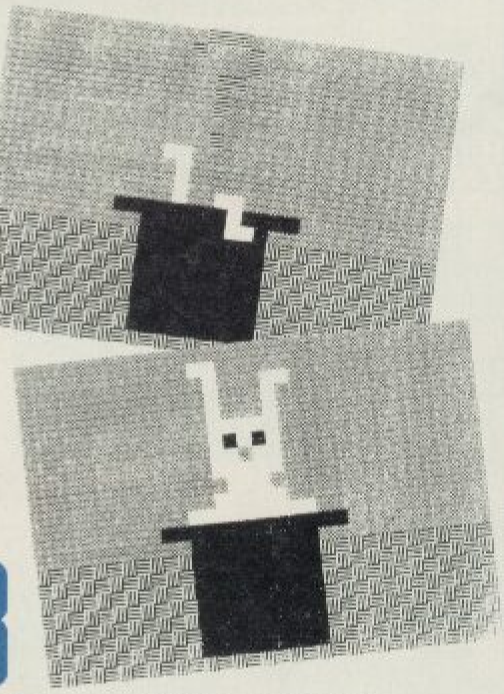
Joystick Jury It's judgement day for all the latest games. A full five pages of frantic arcade action.

PROGRAMMING



48

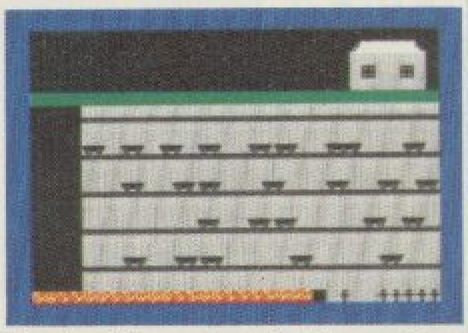
3D Daze Add a whole new dimension to your programs. It's the ultimate 3D graphics creator and it's yours to type in. You'll be amazed!



28

Flash Moves *YS* Newsflash: Loading screens are on the move. Turn on to it — and off!

PROGRAM POWER



50

Miner Mania More levels than nine and more platforms than Elton John! It's the miner game that's major fun!
Copy Right and **Edit Key** Two great utilities that are far from routine!

GAMES EXTRA

COMPETITION

REGULARS

SPECIAL OFFERS

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PUBLISHING ENQUIRIES
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ADVERTISEMENT ENQUIRIES
David Baskerville

01-636 2416
YS HELPLINE
Peter Shaw
(*YS* Helpline enquiries between 10am-1pm and 2-5pm, Wednesdays and Fridays *only!*)

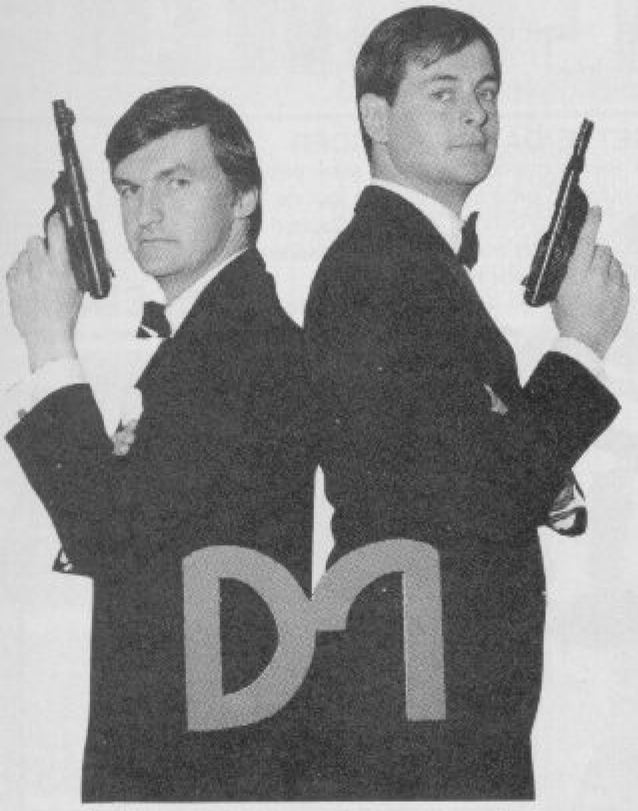
Your Spectrum, Sportscene Specialist Press, 14 Rathbone Place, London W1P 1DE.



43 ROOM ARCADE ADVENTURE + 4 ARCADE GAMES + BOOK
Charlie is here...
in Charlie and the Chocolate Factory
SCORE:0 HIGH:100 LIVES:11
MAIN GATES
For the Spectrum
Cassette + Book £9.95
Cassette only £8.50
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Hill MacGibbon
8 Grafton Street, London W1X 3LA

FRONTLINES

Are you *Quackers?* Will *Kempston* drive you round the bend? Who won our Slimmer of the Year Award? Is it really super, man? Are we getting a new *Bond* age? How fast's a *Slomo*? Do these questions mean anything at all? Find out ... in Frontlines!



Let no-one tell you it's a cushy number working in the computer industry. Last Christmas saw Sir Clive pressing his point home in a more than usually physical way. And now this ... but the photo does have a duel purpose (geddit!). Domark is releasing its premium Bond arcade game, *A View to A Kill* based on the new James Bond movie. If you want to do a bit of pre-release espionage, call Nick Miles on 01-631 3434.

SETTING THE PACE

Remember the Slomo? The add-on that lets even the real duffers win at games by giving them total control over the program's speed. Well, the manufacturer, Nidd Valley Micro Products is launching two new peripherals incorporating the Slomo feature.

Both of the new add-ons are joystick interfaces. The first is the Spectrum Pacesetter — a standard Kempston compatible interface with the addition of the Slomo unit. The other one is a programmable version called the Programmable Pacesetter. Both Pacesetters offer an on/off button plus an LED that lets you know when the Slomo is in operation.

How much, you cry? Well, if you're after the Spectrum Pacesetter prepare to shell out £14.95. The marginally more powerful Programmable Pacesetter will set you back another ten quid.

So, if the pace of some games is just too hot for you, give Nidd Valley Micro Products a bell on (0423) 864488 and find out how they can slow you down.



Slow, slow, quick, quick, Slomo!

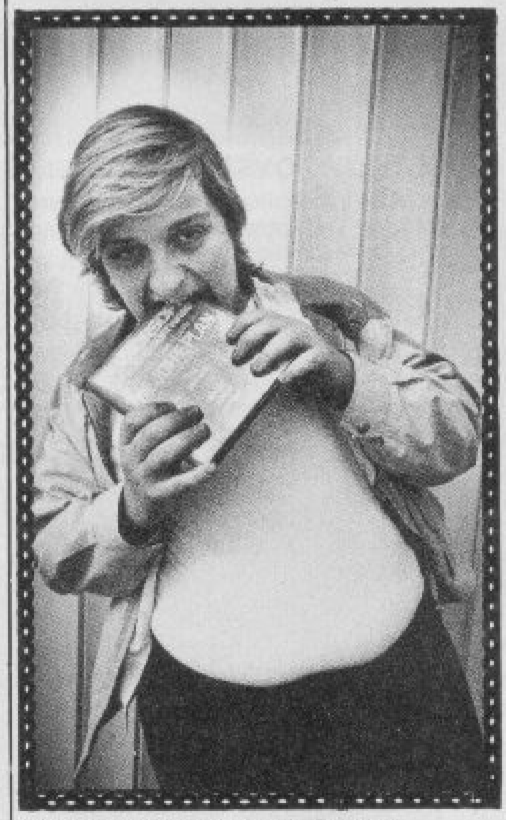
FAT CHANCE

Mum, dad, I've got something to tell you. Sit down mum, this isn't going to be easy. I've been thinking about this one for some time now, and I reckon you ought to know. Mum, dad ... I'm fat! Please dad, don't blame yourself — it's quite normal. Mum, stop chewing the sofa.

OK, so I'm fat — but what should I do about it? F-Plan? Wire up me gnashers? Or will a hacksaw do the trick? I s'pose being 22 stone does have its advantages. No-one kicks sand in your face on the beach — if they can find the sand, that is!

But then along came Mirrorsoft with its *Joffe Plan.* Bona, I thought, a 'no-diet' weight control program it claims. 'No-diet'? No chance. And no more cream cakes, fizzy drinks or choccy biccies either! And if I followed the regime when could I hope to reach the sylph-like figure of nine stone? Weight (*sic*) for it! 1993.

That did it. There's only one way I can describe the program now and that's 'Thought for Food'. Grub up!



Tony 'Slim' Samuels: Before ...



and After — a quite remarkable change!

MORE DRIVE FROM KEMPSTON

Kempston Micro has set the standard for the Speccy's joystick interface and Centronic's printer interface. Now it aims to do the same for disk drives with a new Spectrum interface. All its software is on ROM and the company claims that it'll work with all the standard drives.

And from one sort of driving to another. Kempston has transferred its interest in sponsoring real Grand Prix racing to the small screen with a new game called *Chicane.* It's a racing driving simulation that includes gear changing, cornering at speed and, as the name suggests, it makes a special feature of chicanes.

Chicane crosses the finishing line at £7.95 — if you want more info on either product race to the phone and ring (0234) 856633.



It's the Kempston C5 Interface!


PERIPHERAL POWER
CASSETTE/DATA RECORDER
For your home computer, will allow easy loading of even the most stubborn program. Features include single key record, mains/battery, accepts standard computer leads and 5 pin DIN connector. Also provides exceptional audio quality for fine listening.
(Batteries not included) £24.95
SWEET TALKER
CHEETAH "SWEET TALKER"
Based on an allophone system, program any word or phrase, providing unlimited speech. Now make your Spectrum talk. Compatible with Interface I & II and Spectrum + ... £24.95
MEGASOUND
For 48K Spectrum and ZX Spectrum + Achieve amazing sound capabilities that your Spectrum has been lacking. Just plugs into the user port at the rear of your computer and amplifies sound through your T.V. £10.95
SPECTRUM JOYSTICK INTERFACE
Simply plugs into the user port at the rear of the computer and accepts any Atari style joystick including Quickshot and Kempston.
Comes without rear edge connector at £11.50
or with connector which allows other peripherals to be stacked up at £12.75
56 WAY EXTENSION CONNECTOR
Cheetah's 6" long extension cable enables Spectrum peripherals to be distanced from your computer .. £7.95
32K RAMPACK
Upgrade your 16K ZX Spectrum now! The Cheetah 32K Rampack simply plugs into the user port at the rear of your computer and increases the memory instantly. to 48K £39.95
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Cheetah's neat splitter unit complete with self adhesive pad allows you to keep your T.V. and computer aerial leads plugged in without disturbing the picture £2.25
R.A.T.
Conventional joysticks are dead! The Cheetah Remote Action Transmitter is the most sophisticated computer controller available! Infra red transmission - so there are no leads trailing across the living room. Touch control, extremely fast, can be used with Cheetah RAT/ Kempston compatible software. Complete with receiver/ interface. £29.95
HI-STAK FEET
These instantly applied stick on feet for your ZX 81, Spectrum, New Brain, VIC, TRS etc. tilt the computer and make your keys easier to see and more enjoyable to use, allowing smoother programming. £2.99
EXTRA LONG AERIAL LEAD
Over 15' long. Our super lead will allow you to sit back away from your T.V. and enable you to play games in the comfort of your armchair. £1.50
All Cheetah Peripherals have rear edge connectors for compatibility with all Sinclair accessories.
Prices include VAT, postage & packing.
Delivery normally 14 days.
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Dealer enquiries welcome.
Cheetah, products available from branches of
John Menzies Boots WHSMITH Rumbelows
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Cheetah Marketing Ltd, Dept YS, 24 Ray Street, London EC1R 3DJ. Tel: 01-833 4909
Telex: 8954958

YS BOUND OVER

Reports are coming in that thousands of old copies of *Your Spectrum* have been charged with vagrancy. Ageing but respected issues, circa 1984, have been sighted in increasingly tatty covers, worn out by a lifetime of hard labour.

Here at *YS* we think it's a crime. There are many years of life still left in these back numbers and yet we find them tucked away in cold cupboards or stashed under the bed with last week's socks. Something had to be done — so we did it: the *Your Spectrum* Binder. With one of our new deluxe binders all your back issues'll be able to live long and useful lives together, in comfort.

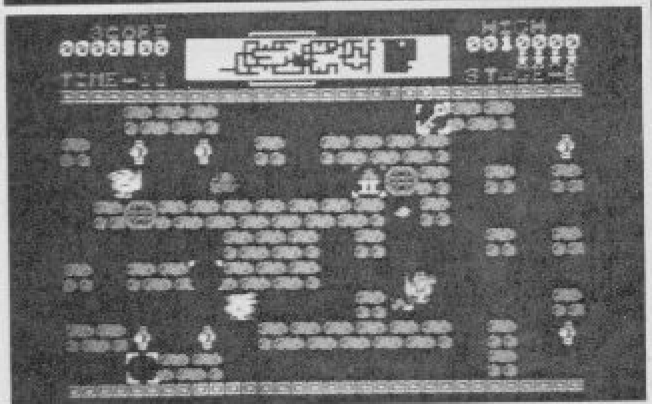
Of course, we will be pressing charges — the binders cost £4.95 in the UK, £5.45 for Europe and £5.95 for the rest of the world. All these token fines include postage and packing. You can order yours on the Back Issues coupon or by sending a cheque for the appropriate amount to YS Binders Offer, *Your Spectrum,* 14 Rathbone Place, London W1P 1DE.

As one of the *YS* Joystick Jurors commented: "This is a marvellous idea. You are now all bound over to keep the pieces."



Poor Duncan Slark. He's only 16 but he's been through hell. First, they forced him to spend hours playing Quicksilva's ancient arcade game *Xadom*. Then they pressed a QL on him and pretended it wasn't the booby prize, made him wear an Observer sweatshirt, and sent him into two week exile in the US of A. And all because he won the first Observer Home Computer Challenge. Finally, he had to sit through a speech from our own Roger Munford (Zzzz. Ed) who was chairman of the judges and watch Troubleshootin' Pete eat and drink his way through the buffet. Truly horrible!

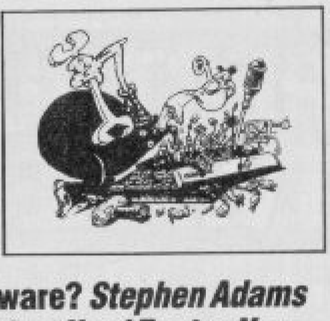
SPARKS FLY



***Quackshot* — let's hope it's not another lame duck.**

Be prepared to duck and shoot when *Quackshot* wings its way onto the market. It's the first of Creative Sparks new range of cheapo games called Sparklers. Think of the funfair, picture the rifle range, and blast those ducks with just your joystick — gone are the days of useless bean bags and bent sights. And if you don't get the ducks, then the rest of the frantic toys'll be out to get you. Get quacking and call Alison Calanda on (0990) 2711 to find out how to get more fun for the fair price of £2.50.

HARD FACTS



Hitches with your hardware? *Stephen Adams* is your man. Get in touch at Hard Facts, *Your Spectrum,* 14 Rathbone Place, London W1P 1DE.

Nobody likes getting bills. Still, it's a bit of a shock when your electricity bill triples and the only explanation is a new Speccy in the house. Well, that's what's happened to **Mrs A Barrasso.** And until she's convinced the Speccy's not the cause of her recent impoverishment her sons aren't allowed to touch it. Well, I reckon you can safely let them get back to the keyboard, Mrs Barrasso. The Spectrum only takes 9 watts and that's about a quarter of the power of the average light bulb.

Of course, there could always be something wrong with the power pack or perhaps you've forgotten how time flies when you're having fun! 'Cos don't forget you're also using a TV (average 300 watts) and a tape recorder (6 watts). Together they'll knock up your bills — but triple them? I don't know — it's been a mighty cold winter!

I've had letters from **Robin Strong** and **J Bullard** who've both been giving their keyboards a proper pounding. So much so, that they've cracked up — the keyboards, silly! The good news is that you can buy replacements for about £2.50. Bash on!

Telly problems next. **Jeff Mundell**'s is corrupting all his tapes, Mmmm, there are two possible explanations for this. It could be either a leakage to earth from the TV to the tape recorder via the Spectrum or bad shielding of the magnetism used to control the TV tube. Either way it's a job for the experts, so call for a qualified TV repairman pronto.

Same advice, I'm afraid, for **Keith Thomas.** His telly keeps on drifting off frequency and he can't adjust his Speccy 'cos he's got an issue 3. Sounds to me as though your TV is unstable when it gets hot.

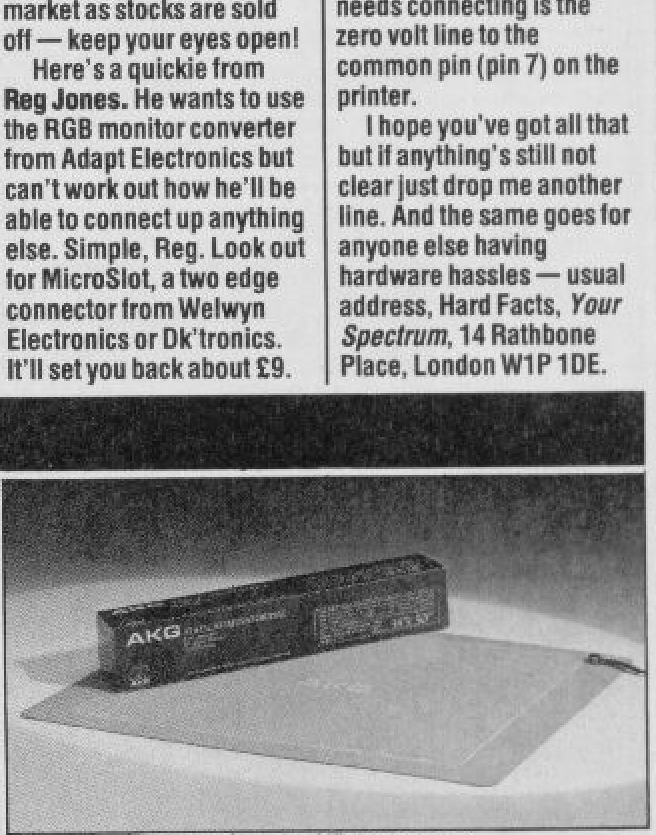
A G Cailes wants to know how to get teletext on his TV using his Spectrum. Well, OEL produced a teletext adaptor that also lets you download software and print out teletext pages onto a Sinclair printer. I say 'produced' because OEL went down the tube (geddit?) last month. Still, that could mean some bargains coming onto the market as stocks are sold off — keep your eyes open!

Here's a quickie from **Reg Jones.** He wants to use the RGB monitor converter from Adapt Electronics but can't work out how he'll be able to connect up anything else. Simple, Reg. Look out for MicroSlot, a two edge connector from Welwyn Electronics or Dk'tronics. It'll set you back about £9.

I V Newson's problem sounds simple enough till you start explaining it. He wants to connect Interface 1 to a printer. Well briefly, this interface requires the printer to be set to 8 bits, no parity, 1 stop bit and at a speed of 300 baud. You can increase this slowly at both ends until errors occur. Now, it's essential that the ER or NOT busy signal (also known as DTR) pin 20 on the printer connector is connected to DTR pin 1 on your Interface 1. This allows the printer to stop the Spectrum from sending data when it's full. If you can't get any data to print try reversing pins 2 and 3 as this is quite a common fault. The only other pin that needs connecting is the zero volt line to the common pin (pin 7) on the printer.

I hope you've got all that but if anything's still not clear just drop me another line. And the same goes for anyone else having hardware hassles — usual address, Hard Facts, *Your Spectrum,* 14 Rathbone Place, London W1P 1DE.

NO CHARGE



The answer to all those electric blues?

Have you ever had equipment or programs damaged by a build up of static electricity? Well, AKG has come up with a more sensible alternative to wearing wellies while you're programming. It's an eliminator mat designed to discharge that troublesome static.

Available in two sizes, the mat's said to be hardwearing and it comes with a snap-on earthing wire so your Speccy can have its very own lightning conductor. Still, the price may give some of you a shock — you'll have to stump up £11.99. But if you don't reckon you're being overcharged, you can call AKG on (04868) 25702.

FRONTLINES

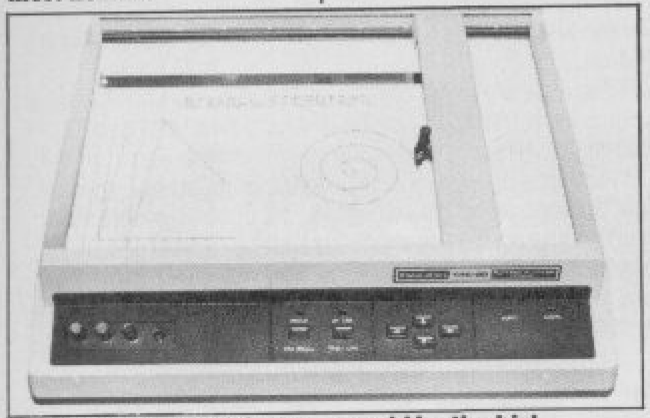
A BRIGHTER SHADE OF PALE

Bizzell Computers have announced a high speed, four colour printer/plotter for £399.

The printer/plotter prints vertically or horizontally in text, and in four directions in graphics mode. With a plotting area of 298×216mm, and a speed of 100mm/sec the machine is suitable for most normal applications.

One big advantage is that it includes both parallel (Centronics) and serial (RS232) interfaces, and you can get at all its features through Basic.

If you want some more information on this new add-on, then give Bizzel Computers a ring on 095-389 592.



The Bizzell printer/plotter — could be the biz!

TORC OF THE TOWN



Six days solid on *Dragontorc* — how did he stay awake?

Does this scene look familiar? Cast your mind back to the quest to complete *Avalon*. Well, here's a double take ... but this time the game's *Dragontorc*, the follow-up from Hewson Consultants.

Eamon McGing, whose home-town is Camberley in Surrey, ended his epic adventure at 11.30pm on April 7th after six solid days of addictive playing. And his reward? The grand title of High Lorelord plus an official pat on the back from Hewson.

Now, if you're a careless torcer or you've found the game's beginning to drag on, send an sae to Hewson's offices at 7 Graeme Close, Blewbury, Oxon OX11 9QE and they'll unravel a few secrets for you.

WE'VE GOT IT TAPED

Impressed by the power-packed programs in *YS*? Hooked on our unrivalled routines? Too lazy to type them all in? Well, now your problem's solved. We've joined up with Digi'Tape to bring the very best selection of the *Your Spectrum* monthly dose of programming to you on tape. So, if you've got better things to do with your hands, you can now say farewell to all that typing — LOAD "" are the only keys you'll ever need again!

If you like the idea — and at 3 quid including p&p you can hardly go wrong — you'll find the full details in Digi'Tape's ad on page 57 in this issue. Plus the tapes will be packed up and posted within 24 hours.

This is also good news if you're thinking of submitting your latest masterpiece to us. If it's published, you'll not only receive lots of lovely lolly but royalties for every tape sold. Even more reason (*you need more? Ed*) for sending in your megaprograms to Opportunity Knocks.



FROM THE H/P

Y'all came gunnin' for me again this month so it's straight in with some of your trickier shots.

Gary Siegal of Ramsey is a regular subscriber to the Helpline and he rang in this month about the Mac Hack letter that appeared in the May Forum. Remember that one — it offered infinite lives on the Macman program from issue 12. Well, it looks pretty clear that someone's made a boob here 'cos the listing is trying to POKE into the ROM and that's just not on. Gary's got a RAM Turbo, so he's come up with the following POKEs that should get it going:

```
POKE 29256,247: POKE
29260,95: POKE 29265,247:
POKE 29269,87: POKE
29274,247: POKE 29278,71:
POKE 29283,247: POKE
29287,79
```

Gary assures me that this works just fine on the right-hand port of the RAM interface.

Off to Wolverhampton next. **Bill Pitt** phoned to ask how he could get a screen dump out of his Teletype printer with the Maplin EPROM RS232 interface. As Bill says, this set up works fine if all you want is a text printer but it hasn't got the flexibilities of a dot matrix head, so graphics are a bit of a problem. Now Bill admits that he's no master of machine code, so I've taken that into account with my solution. For what it's worth, here goes. Use a short loop that checks each pixel individually using the Point command. Then if a pixel is set, print an 'X' or something similar but if a pixel is reset, i.e. blank, then skip over it with a space. Slow, maybe. Crude, most definitely. Still, it works which is the main thing.

Jason Davis from Bournemouth rang in with a problem he's been having with the Gosub stack. At present he's writing a megaprogram in Basic that uses one heck of a lot of Gosub statements. Problem is that he's filled the Gosub stack so some Returns fail to operate.

Well, Jason the quick and easy way round this is to use variable names as return addresses. Let's have a look at an example. Say you've got a subroutine at lines 9000 — now replace the Return command with the statement GO TO RETURN, then define your RETURN variable on the line before you call the subroutine. Simple? Well, take a look!

```
10 GO SUB 9000
.
.
9000 REM SUBROUTINE
START
.
9100 RETURN
```

Now that'll become:

```
9 LET return = 11
10 GO TO 9000
.
.
9000 REM SUBROUTINE
START
.
.
9100 GO TO return
```

Got that? Jolly good. I hope we get to have a look at this megaprogram when it's finished.

Now up to Stockport where **Melanie Wright** wants to know how to control her Speccy's sound in machine code. Well, here goes Melanie — this routine should provide all the info you need to synthesise your Spectrum:

```
LD DE, (duration of sound)
LD HL, (pitch of sound)
CALL 949d (that's 03B5h in
hex)
```

Now to work out the duration, just follow the formula:

```
TIME (in secs) * FREQUENCY
OF NOTES (in Hz)
```

And the pitch can be worked out using:

```
437500/FREQUENCY (in Hz)
— 30.125
```

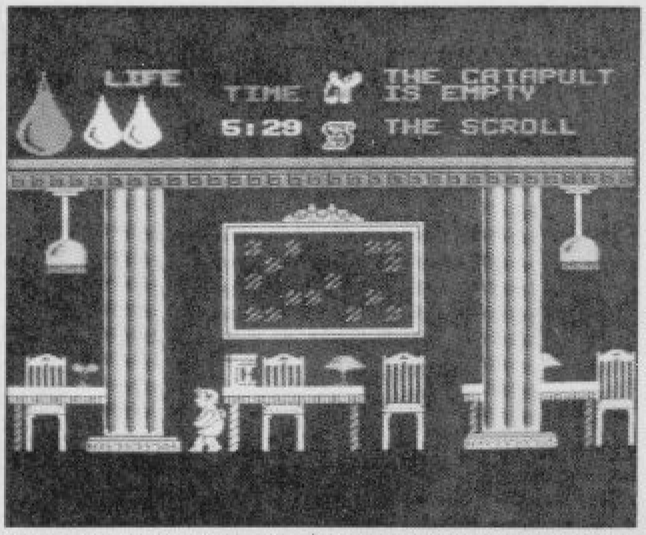
Watch out though 'cos the maximum duration is about ten seconds. Pretty neat, eh? *(Oh, roll over Beethoven. Ed)*

OK, that's it for another month. Keep those calls coming with all your programming quirks and queries. Till then, catch you on the phones...

Troubleshootin' Pete

Pete's phone lines are open from 10am-1pm and 2-5pm on Wednesdays and Fridays. Ring him on 01-636 2416.

FRONTLINES

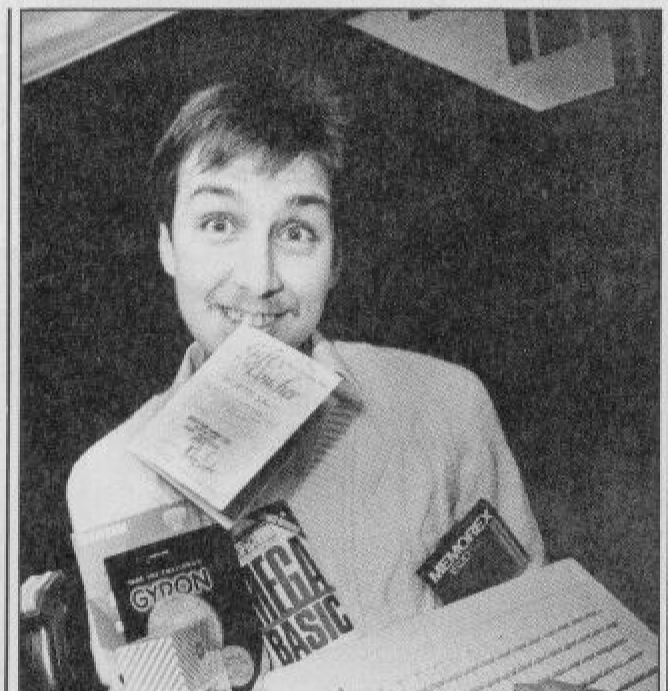


Take a look at what's in store for you in Mikro-Gen's latest, *Herbert's Dummy Run*. Yes, Wally's bothersome babe is back to wreak havoc in the local department store. Your task is to guide the bouncing brat back to mum 'n' dad before he turns Harrods into Horrids. One to shop around for though it'll still cost you £9.95!

SPEND, SPEND, SPEND

Think of it — five hundred smackers to spend on your Speccy. What would you do other than jumping for joy? Well, it was a dream come true for **Brian Rumbelow** of Deal. If you remember from last month's Frontlines, he won the Spectrum UK Competition and with it a voucher for £500 to spend on Spectrum hard and software in one of their stores.

He came down to the smoke to collect his prize and lash out the lolly at Computers of Wigmore Street. So, what did he cart off in his giant carrier bag at the end of the day? The real biggie was an Opus Discovery 2 disk drive, the one with two drives. Brian saw it first in Frontlines, liked the look and the spec and knew straight away he wanted one. Instantly he could upgrade his Speccy into a powerful programming tool. But 330 quid's a lot of lolly — unless someone else is paying, of course.



It's the Your Spectrum Double or Drop compo

Having splashed out on the Discovery, his Speccy would look a little lost without a real keyboard, so he plumped for the Saga 1. Yes, he'd read the keyboard review in *YS* but none of those impressed him. And after all the Saga has a pen rest!

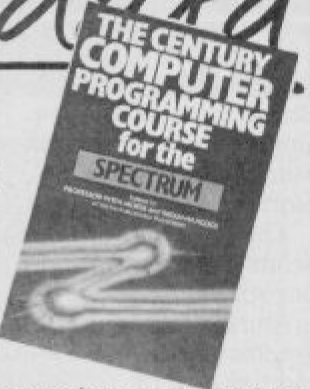
The hardware was completed with a Quickshot II joystick as Daley Thompson got to Brian's last one! And a game to play with it? *Gryon* was the choice. Again he'd read about it in Frontlines, liked the look of the graphics and, as his luck's obviously in, thought he'd have a crack at winning the Porsche.

Add to this ten 3½" disk, a copy of *The Complete Spectrum ROM Disassembly* from Melbourne House to help with his hacking and that's just about it. Oh, nearly forgot, there *was* one last thing — a copy of *YS MegaBasic.* Need we say more?

Finally, our thanks to Spectrum UK for stumping up the cash (there were another five winners who each walked off with a hundred quid!), to Computers of Wigmore Street for getting everything in and to Brian himself for letting Sleepy make him look such a wally in the photo!

Right then, bet you're pretty jealous, eh? If you had five hundred quid what would you have spent it on? (*No, Peter, hols in the Bahamas don't count. Ed*)

Paperdata



The Century Programming Course for the Spectrum
Century Communications
£12.95

Tense, nervous headache? Have you just acquired a shiny new Speccy but found your first bash at learning Basic has proved a brain-numbing experience? Well, there are always alternatives to struggling with the Speccy's manual. Have you thought about joining a computer club or evening classes or perhaps you'd rather sit down with a book...

The Century Programming Course for the Spectrum is a new book from Century Communications that aims to teach you all there is to know about Sinclair Basic, as well as instilling in you the best programming techniques. To get the best out of it as a course, the book suggests that you should restrict yourself to reading an hour's worth a night. Now this mightn't sound very much but there's so much info here, you'd soon be overwhelmed if you attempted more.

The really gutsy part of the book is split into four sections. The first covers the relatively simple aspects of Spectrum programming like cursor modes, graphics modes, the PRINT statement, the LET command and simple arithmetic. OK, so far! Part two just about wraps up all the other commands, with full details of how each is arranged. Here you'll find IF THEN, FOR TO, STEP and NEXT plus the finer points of PRINT when using ink, paper and AT or TAB controls.

Between them, parts three and four go over all the really heavy programming techniques, like bubble, binary and ripple shorting. And although the book sets out to comprehensively cover Basic, it doesn't avoid all mention of machine code matters. My only qualm is with the free'n'easy use of flow-charts throughout the book — I'm just not convinced that they add clarity, not confusion.

Still, there's no doubt that this is a pretty encyclopaedic tome (as it should be for £12.95!) that can be used as a reference book even if you don't need to begin right back at the basics. But be warned, it's full of jargon and often expects you to have an IQ in excess of Sir Clive's! So if you're a real beginner a better suggestion might be to splash out on a somewhat less technical book. (***How about a plug for the*** *Capital Radio Book of Computers and Simple Programming?* ***Troubleshootin' Pete***) Once you've mastered that, you'll be ready to have a crack at the Century course.

Tony Samuels

SUPERMANIC

Is it a bird? Is it a plane? Nope, it's another game based on a well-hyped cartoon strip star. This time it's *Superman* who's come out of the telephone booth and into the box.

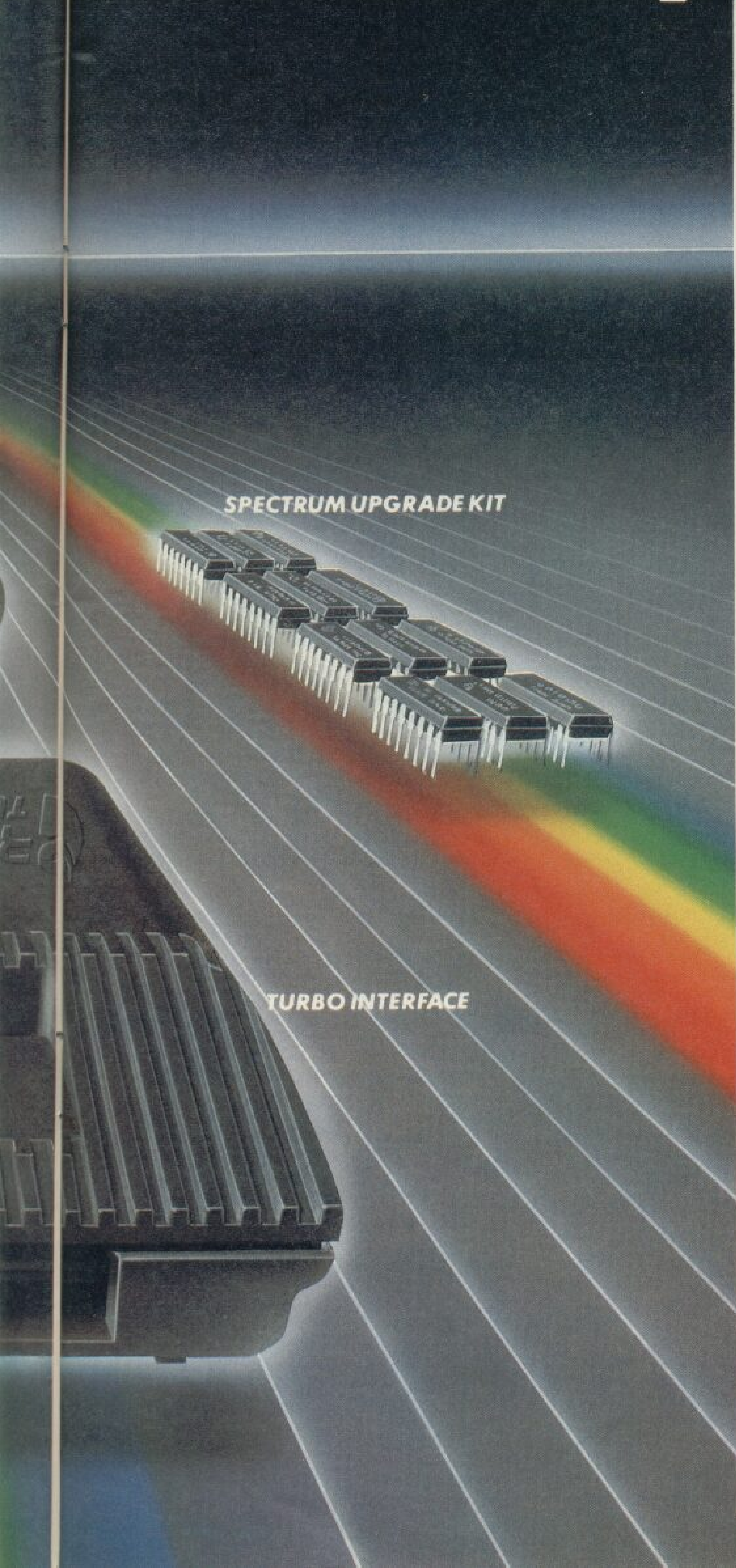
The game's going to be among the first from a new label called Monolith, a sister company to Beyond Software. This first move from the new company is to dream up one of those corny titles for a chunk of code. This one's called 'authoring' and it'll allow the game's designers to create superb animated cartoon graphics. (*What, no Reprosound, Sensory Animation and Smellyvision as well? Ed*)

While we all wait for Superman to change into his underpants, Monolith is releasing a couple of games called *Rockford's Riot* and *Quake Minus One.* If you find all this too Kryptic, get on the hot-line to Mark Gardiner on 01-353 8445.

We'll take you bey



yond the Spectrum.



Four great new add-ons from Ram, Number One in everything for the Spectrum...

TURBO INTERFACE

Our unique Turbo Interface outperforms any Spectrum interface – it works with ROM cartridges, 2 standard joysticks, and there's a full expansion bus at the rear. The Turbo supports Kempston, Protek and Interface 2 software and loads from cassette – or instantly from a ROM cartridge. It really makes the most of the Quickshot II's rapid-fire action, and with a unique built-in power safety device, it's amazing value at just £22.95.

QUICKSHOT II AUTO RAPID-FIRE JOYSTICK

The famous Quickshot II is the top games joystick, with a sleek trigger fire button for quick reactions, an auto fire switch for continuous shooting and a new, improved grip. Revolutionary built-in stabilising suction cups mean a sure, firm grip – a snip at £9.95.

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Boost the power of your Spectrum, or Spectrum +. This Kempston-compatible interface gets the most from your games – electrify your enemies with real power and lightning-fast reactions right under your fingertips. Costs just £9.95.

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If you've a 16K Spectrum micro, this handy and inexpensive add-in kit boosts the RAM memory to a powerful 48K, so you can run the latest and greatest software, the most exciting games around – and expand your own programming possibilities! Only £21.95.

Where can you get your hands on Ram's amazing Spectrum add-ons? You can see them at branches of Boots, Menzies, Spectrum Group computer centres, and good computer stores everywhere. Or return the coupon below.

To: RAM Electronics (Fleet) Ltd (Dept YS), 106 Fleet Road, Fleet, Hampshire GU13 8PA.

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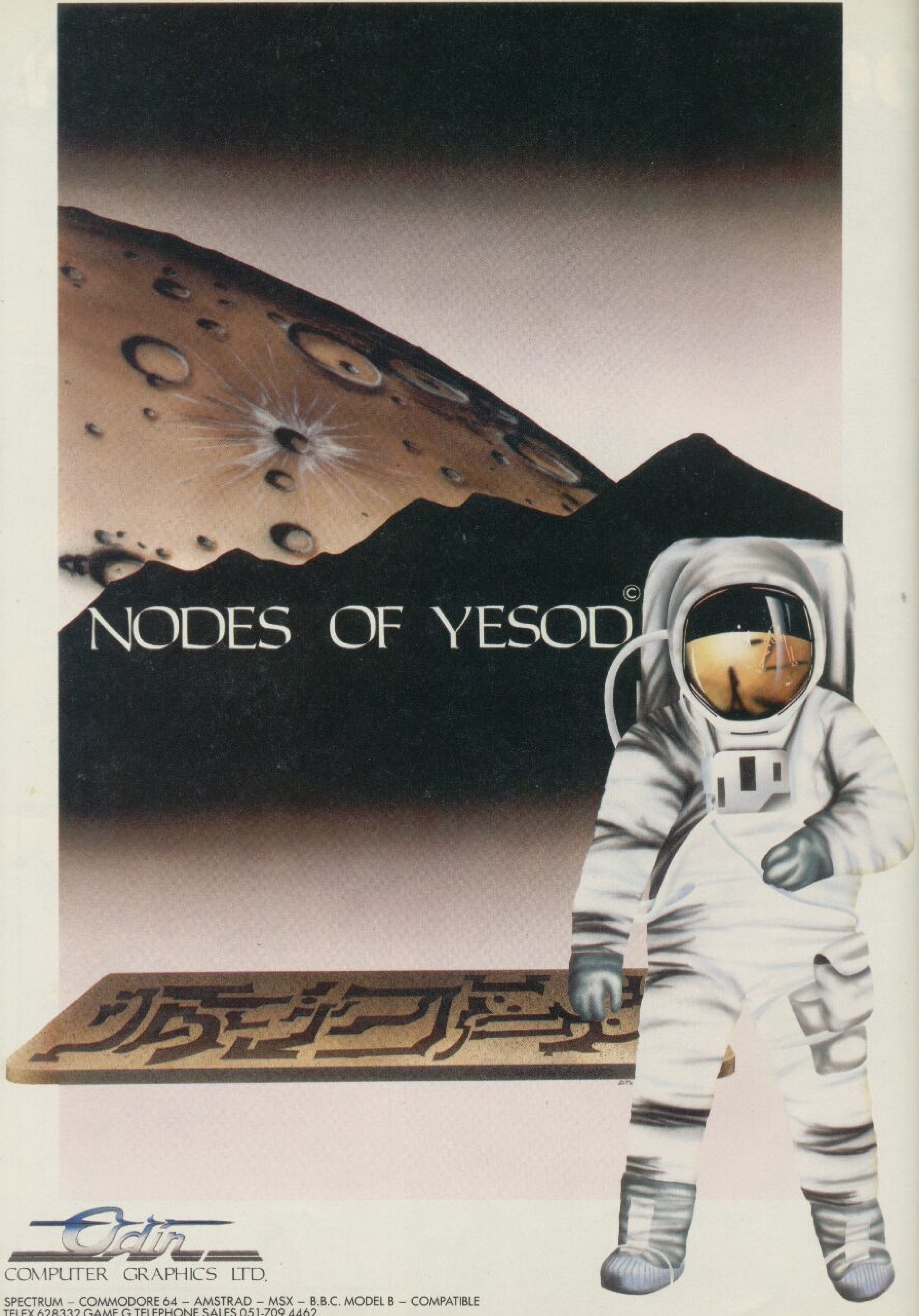
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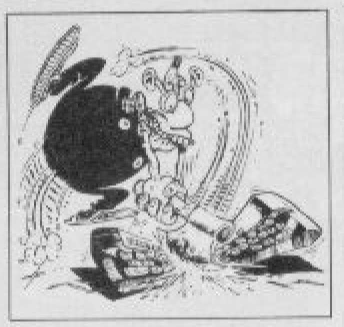
RAM

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NODES OF YESOD©

FRONTLINES

HACKING AWAY



The column that POKEs more fun. Send your hacking hints to Andrew Pennell, *Your Spectrum*, 14 Rathbone Place, London W1P 1DE.

D'you remember back as far as issue 14? Well, **Mark Gibson** was pretty desperate for POKEs for *Pinball Wizard*. As usual a couple of *YS* readers have come to the rescue. So, here goes Mark, the magic POKEs that'll turn you into a wizard at Pinball. First, LOAD "CODE 36384 to get it in, do POKE 51566,0 for endless lives, then SAVE "PINBALL" CODE 36384, 16128 to save the modified version. Next, change the LOAD ""CODE command in the loader to LOAD ""CODE 16384 and the pinball table is now yours. Rock on, Tommy!

Those same *YS* hackers, **Tom Dalziel** and **Paul Macpherson**, have also come up with the goods on *Finders Keepers*, that royal rollick from Mastertronic. For infinite lives, POKE 34208,0 will for the trick or you could try POKE 30394 with the number of lives you want. Watch out though 'cos more than four may make a mighty mess of the screen so you'll need POKE 33969,0 to disable the printing of remaining lives. Thanks also to a hacker from Holland, **Felix Gerrinckx** from Antwerp whose help was also worth a king's ransom.

And now code-crackers, here's a record breaker. **James Cockle** is nine years old and easily qualifies as the youngest hacker who's ever written in. He's come up with a POKE for *Atic Atac* that'll stop you losing energy — POKE 35353,0. I dread to think what young James'll be getting up to by the time he's my age! (*Drawing his pension I expect. Ed.*).

Now here's a funny thing. **Kieron Matthews** has found that a POKE we printed way back in issue 9 for *Sabre Wulf* has a rather peculiar effect on *Lunar Jetman*. It prevents the missile from launching and ruining your chances. Then, to reach the next level you should wait for the time to run out and shoot at the base. Trouble is Kieron just can't get past level 10 even with the POKE, 'cos he can't find the trailer anywhere. Mind you, there's a good reason for that — the trailer just doesn't exist! It may be on the inlay card but it's certainly not in the game. To get any further you'll just have to do a Robert the Bruce — try and try again!

There now follows an intermission for a spot of complete lunacy. **Hacker Hook** has written to ask for the POKEs for *Pud Pud* from Ocean. Now I've never heard of it but I was willing to give him the benefiit of the doubt until he declared that he's also a fan of *Pud Pud* music. Yeah, yeah! We'll be sending the van around.

Another candidate for the men in white coats is **Mark Sanderson** — he's mad enough to send in yet another POKE for ... no I can't bring myself to say it ... oh, alright but only if I can jumble it up — *Jilly T. Sweet*! This is the last one EVER — or at least till the next time whichever is the soonest. Try: FOR f=44800 TO 44928:POKE f,PEEK(f+512):NEXT f. Now one of Matthew Smith's unused sprites is revealed — you'll see the penknife change into a moving top-hat. To see another one alter the 512 to 640, run it again and you'll get a rotating periscope.

Moving on to a rather newer game, **George Baselen** has sent in the code words that'll help you get from level to level in *Wizard's Lair*. They are LYONS, LIAYR, VAULT, DUNGN, CRPYT, HAWLO and CAIVE. I just hope the magic spells in the game are better than these ones!

Finally, a word about Microdrive conversions. A lot of you are asking about the programs that do the conversions for you. Well, the simplest is actually free, supplied with the Expanson System on the demo cartridge, written by yours truly. It's a 'dumb' converter (*I was gonna say that figures, but I wouldn't dare!. Ed*) just copying blindly, though it makes no attempt to change any code.

One secret I'm suprised no-one's sussed yet can be seen if you load the program 'copier' as usual, then enter as a command: *© . Since I was the one who hid it, I shan't give away the message here — so get cracking.

YS FAILED

Did you type in our Mastermind program from the last issue with the intention of boning up for your 'O' Levels? You did? Oops! We're sorry if you failed them 'cos you spent most of your revision time trying to iron out the buglets.

Just whip out the two POKEs in line 320 and while you're at it, you don't need lines 1090-1100. Look at it this way — you can always re-sit them again next year!!

MICRODRIVIN' ... STRAIGHT ON

Till now, it's been a bit of a rough ride trying to convert all your programs from tape to microdrive. But the Evesham Micro Centre reckons its new Interface III will smooth the way to trouble-free conversions.

The Interface III's an easy-to-operate hardware add-on that allows a 'snapshot' to be taken at any stage of a program. At just under £40 it's not cheap but it could be the answer to every microdriver's dream.

If you're not convinced that it'll cope with all your software, check it out on (0386) 49641. Or you can wait for a full road-test in the next issue.

JET LAG

Just when you thought it was safe to go back to your Speccy ... he's back! And just when we thought we might never have to mention the initials *JSW* again, Software Projects has done the dirty on us. Yep, *Jet Set Willy II* is due for imminent release.

While you're reaching for the tranquilizers, we'll tell you what we've weedled out of Software Projects. The game's going to be set once again in Miner Willy's mansion but he's had a few extensions built to the West Wing since *JSW* — there'll be a lot more rooms this time.

So, what's the cost? Well, other than sleepless nights and sore eyes, it'll set you back £6.95. That's all Software Projects is telling us at the moment but if you want to have a go at getting more info, ring them on 051-428 7990.

ALIEN MATE

Following our call for your *Alien 8* masterpieces, comic cartoonist Jeff Thomas has sent in his spaced-out creation in the form of an *Alien 8* comic book designed to run on the Speccy.

Jeff put it together using *YS MegaBasic* and the Screen Scrunger program from Issue 13 and as you can see from our selection of his screen shots, his sense of humour is definitely as warped as the Editor's. And that's why the Ed's awarding the software prize to Jeff — unless of course, you reckon you can do better!





Just two of joker Jeff Thomas's cartoon creations

Save £££s off selected software titles in the exclusive special offer for all *YS* readers. Go for it . . .

No we're not going *soft* in the head, we really are offering you our *wares* at special-super-saving-slashed prices. See this month's great savings — on those chart-topping favourites voted for by you! Pocket the difference, of lash out on more of our bargains! Don't wait to play, order today!

YS SOFTWARES!

	R.R.P.	OUR PRICE
☐ **Monty Mole** Gremlin Graphics (008)	£6.95	£5.95
☐ **Alien 8** Ultimate (022)	£9.95	£8.95
☐ **Delay Thompson's Decathlon** Ocean (001)	£6.90	£5.90
☐ **Jet Set Willy** Software Projects (006)	£5.95	£4.95
☐ **Underwurlde** Ultimate (002)	£9.95	£8.95
☐ **Match Day** Ocean (004)	£7.95	£6.95
☐ **Knightlore** Ultimate (005)	£9.95	£8.95
☐ **Atic Atac** Ultimate (013)	£5.50	£4.50
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At these ridiculous prices, how could I resist this exclusive *YS* offer? I've ticked the games I want to order and enclosed a cheque for £.... made out to Sportscene Specialist Press Ltd.
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YOUR SPECTRUM GO FOR GOLD

Fitness, stamina and hours of jogging in the rain — you won't need any of these to win a *YS* Games Gold Medal. But you're gonna have to be good at games — the Best!

Go for gold, we cried ... where were you? The race to win got off to a false start I'm afraid and it was only the *YS* supreme team that sweated it out to the top of the high score challenge! So come on, limber up and join the frontrunners. We want to see *your* triumphant faces opposite next month! Now's your chance to shine as a star games player, but remember no hyped or hacked scores please, they'll only trip you up at the *YS* Games Finals to be held later this year.

Of course, if you can't match any of the scores, don't be put off. We're still after your votes. Send in your list of the five games you find most unput-downable and your pick of the up'n'coming' chart-toppers for the *YS* Top 10 Hot Shots. Do it and you'll be in with a chance of winning three free pieces of software — just like *Ian Wong* of Workington. Nice one Ian — watch out for the postman!

YS GO FOR GOLD

My top 5 all-time greats are:

1 ....
2 ....
3 ....
4 ....
5 ....

My top scores are*:

1 ....
2 ....
3 ....
4 ....
5 ....

The next games I'm gonna rush out and buy are:

1 ....
2 ....
3 ....
4 ....
5 ....

*You don't have to fill it all in but make sure you specify the level of difficulty for your scores.

If you're going for gold, stick your mugshot here

Make sure you send us a black and white photo of yourself if you've filled in your high scores.

I'm going for gold! My name is:

....

Address ....

....

.... **Postcode** ....

Now ask an independent witness to sign the coupon

Independent Witness

Name ....

Address ....

....

.... **Postcode** ....

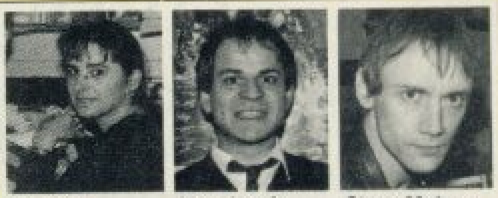
Complete this coupon and send it to Go For Gold, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

YOUR SPECTRUM

ALL • TIME • TOP • TEN



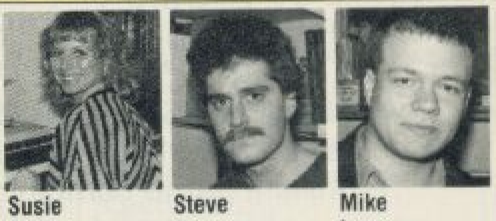
Teresa Maughan Level 18 | David Baskerville Level 15 | Roger Munford Level 12



Claudia Jeffries 38% | Jerry Lewis 30% | Steve Malone 16%



Wendy Smith Day one 470,002 Day two 604,324 | Joe Harrower Day one 302,382 Day two 403,426 | Kevin Cox Day one 202,322 Day two 320,344



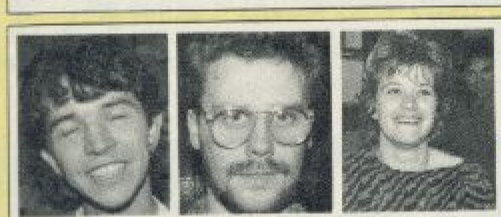
Susie Matthews 75 items | Steve Shreyas 73 items | Mike Leaman 60 items



Trevor Emmanus 30% | David Baskerville 27% | Louise Cook 22%



Andrew Stark 8-1 (five minute game) | Derek Cohen 7-2 (five minute game) | Steve Colwell 5-1 (five minute game)



Pete Shaw 50% 3 Charms | Jimmy Egerton 35% 2 Charms | Penny Rouch 30% 2 Charms



Martin McGuinness 67% | Roger Willis 53% | Steve Broadhurst 42%



Alan Towler 23,000 | Beth Ford 16,000 | Julian Dorr 12,500



John Kay 260,000 at 84% | Steve Colwell 200,000 at 70% | Steve Malone 160,000 at 49%

Position	Game	Publisher	Last time
1	MONTY MOLE	GREMLIN GRAPHICS	5
2	ALIEN 8	ULTIMATE	NEW ENTRY
3	DALEY THOMPSON'S DECATHLON	OCEAN	2
4	JET SET WILLY	SOFTWARE PROJECTS	6
5	UNDERWURDLE	ULTIMATE	1
6	MATCH DAY	OCEAN	3
7	KNIGHTLORE	ULTIMATE	4
8	ATIC ATAC	ULTIMATE	9
9	GHOSTBUSTERS	ACTIVISION	10
10	SABREWULF	ULTIMATE	8

TOP TEN HOT SHOTS

Position	Game	Publisher
1	STARION	MELBOURNE HOUSE
2	SPY HUNTER	BALLY/MIDWAY
3	RAID OVER MOSCOW	US GOLD
4	SHADOWFIRE	BEYOND
5	GREMLINS	ADVENTURE INTERNATIONAL
6	GIVE MY REGARDS TO BROAD ST.	MIND GAMES
7	ROCKY HORROR SHOW	CRL
8	EVERYONE'S A WALLY	MIKRO GEN
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FORUM

Write to us — there's a bundle of free Spectrum software for this month's Star Letter! Write to Forum, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

TOY SHOP

At Eldon Square in Newcastle the assistant in the computer shop needs a visit from the big boys.

When I visited the shop with a Commodore user (his name's Paul Mallabar but I don't suppose you're interested) *(Nope. Ed)* and asked if the assistant had a Spectrum in stock, he said no. What's more, he even gave my friend a letter saying that compared with the Commodore, the Spectrum's just a toy.

I think this man's a real *(at this point the letter has a nasty attack of the editorial red pen. Ed)*. Do you agree? If I get this letter published I'll take it into the shop and show it to him. That should make him feel a bigger... *(more red pen. Ed)*

Jonathan Barry
Tyne & Wear

Don't start dragging us into your squabbles. And as for the big boys, there's no one at the YS Tower Block over 3ft 6ins. Honest. Troubleshootin' Pete.

FOR...

May I add a point to your *Speed Trial* review in issue 14? I may? *(S'pose so. Ed)* Thanks. I bought a Wafadrive in December '84, and I got what I thought was a wrong 'un.

Well, a letter to Rotronics brought an offer of a replacement and this was despatched before they received my Wafadrive. A phone call came the same day the Wafadrive was delivered enquiring if things were OK. They weren't, so they suggested my Speccy spent a holiday at their place for a check-up where a faulty ULA was found and replaced.

Marvellous service, don't you think? The Wafadrive may not be as fast as some but this more than makes up for it.

Finally, how about a *Patching Up the Drives* for Wafa owners?

A E Denison
Wortley

Any takers on that one? Ed.

AND AGAINST....

After seeing your bit on the Wafadrive in Frontlines of November '84, I sent to SMT for more info. I was impressed, so I thought, great I'll send for one. Forty-two days later (another twenty-eight day promise down the drain) it arrived.

Having scanned the manual to find out how to load a program, I tried to load *Spectral Writer*. After several error messages, it finally loaded. A few days later, I had another go. No luck. So, I rang Rotronics who said I probably had a faulty wafer and I should send it back. The replacement also failed to load.

This was not the only problem. The tape inside the 64K wafer had snapped and the 128K had packed up altogether. The Wafadrive O/S was also refusing to accept legal commands. All the wafers were entrusted to the postman. A fortnight later I received a call apologising for the problems and then the new wafers arrived.

My troubles are still not over. The *Spectral Writer* wafer has given up the ghost again though I did manage to save it to tape this time. The O/S still fails to accept commands and another 128K wafer has packed in.

Is it just me?

Robert Emery
Sheringham, Norfolk

Could be. But then again we'll wait and see how others have fared. Troubleshootin' Pete.

UP 'N' DOWN UNDER

In Circe, *YS* issue 14, why is Tim Hartnell holding a book upside-down? Is it because he's Australian?

Please tell me as I've never managed to program upside-down.

James Harrington
Scunthorpe

OK, James you spotted the mistake. The photo was of course, printed the wrong way up. The book was really the right way up all the time but Tim, being an Australian, should have been upside-down. Ed.

OFF 'IS ED?

Don't keep us nosey-parkers in suspense any longer! Where has Bodger Munford, I mean our, good ol' Ed, gone skedaddling off to lately? Could the rumours be true? Has he really done a bunk with the petty-cash and you-know-who's missis!? *(Tell me more. T.P.)*

Of course, I fully realise, thing (I can call you thing, can't I?), *(call me whatever you like, just stop writing me letters. Ed.)*, who your new boss is. Why else would I put you in the awkward and potentially dangerous situation of publishing this insinuatinng piece of garbage!? *(Sense at last. Ed)*. I just hope that he doesn't box you in the ear-socket, that's all! He might even sack you!! *(I should be so lucky! Ed.)*

You really ought to be more careful about offending your boss you know.

My kindest regards to Bodger, I mean Rodger for all the hard work he's put into *YS* as Editor, and good luck to you Kev. (Hmmm, we'll have to think of a nickname for you too!)

Anthony Mayers
Clywd

Nickname? Huh, they'll be giving me a number and locking me away if I receive any more loony letters like this. What do you think has really happened to Roger? Still, they say he's being well looked after and there's a bed reserved for me. Ed.

MEGAHACK

Pssst, wanna be an instant hacker? Then load a copy of *YS MegaBasic* right now (you do have a copy don't you?).

Once it's loaded, you're asked to Press 'm' to copy to a microdrive (aaargh, I feel an attack of BAD SECTORS coming on). Instead, quickly press the following sequence of keys: g,a,m,l.

Do it as quickly as possible as you've only got four seconds to press all four keys. For all your hard work you'll be greeted with a message usually hidden from yer average Speccy user.

Andy Taylor
Sheffield

And of course, there's no chance of us letting on what the secret message is. You'll just have to take a butchers at your own copy of YS MegaBasic for that.

Now, what we'd really like to know is, what do the letters stand for? We can work out m.l, no problem, but who's g.a? C'mon Mike, name the mystery person — we think the world should be told!

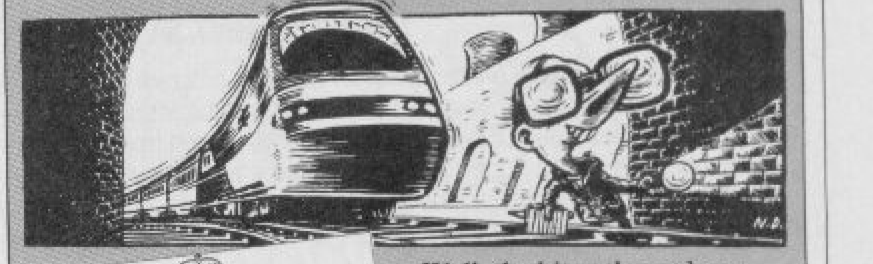
PATIENT ROYALTY

After your request in Program Power for a short routine that would only allow kings to be placed on empty files in the Patience game, *YS* issue No.14, here are my alterations to allow you to do just that.

First of all, modify line 1628 to read;

```
PRINT INK 4;AT
```

THE YS TRAINSPOTTER AWARD





Keep your eyes open and you too could be catching a YS Trainspotter's award!

OK, the game's up! I found the mistake. Yes, believe it or not, I have. Guess where?

I was reading through the May *Top 20* and at number 16, there's *Chequered Flag*. Well, the bit at the end says "Rev-right-up and win the race in this speed bike fun!"

Bike? *BIKE*? It's about CARS! Spelt C-A-R-S. Honestly, I couldn't put you in charge of a C5.

You silly boy, Ed! Take 10,000 lines! Wally, Bikes? Hah!

Keith Whitmore (aged 11)
Basildon

I must not have any more silly ideas like the YS Trainspotter Award. Ed.
I must not have any...

MSX · TATUNG EINSTEIN · ZX SPECTRUM · SINCLAIR QL · AMSTRAD CPC 464

Thinking so
...thi

THE TASWORD WORD PROCESSORS

The extensive features of the Tasword word processors are ideal for both the home and business user. Every Tasword comes complete with a comprehensive manual and a cassette or disc. The cassette or disc contains your TASWORD and TASWORD TUTOR. This teaches you word processing using TASWORD. Whether you have serious applications or simply want to learn about word processing, TASWORD and TASWORD TUTOR make it easy and enjoyable.

TASWORD TWO (Spectrum)

64 characters per line on the screen!

"Without doubt, the best utility I have reviewed for the Spectrum." HOME COMPUTING WEEKLY APRIL 1984

"If you have been looking for a word processor, then look no further." CRASH JUNE 1984

The cassette program is supplied with instructions for microdrive conversion.

TASWORD TWO* ZX 48K Spectrum
cassette **£13.90**
microdrive cartridge **£15.40**

TASWORD 464

"There is no better justification for buying a 464 than this program."
POPULAR COMPUTING WEEKLY NOVEMBER 1984

A particularly sophisticated yet easy to use program. Now available on disc. The cassette version is supplied with instructions for transferring to disc.

TASWORD 464* Amstrad CPC 464
cassette **£19.95**
disc **£22.95**

TASWORD EINSTEIN

A sixty-four character per line display and the ability to hold over five hundred lines of text at any time are just some of the features of this, the most recent, of the Taswords. Full interaction with the disc system – e.g. Tasword detects the presence of added drives and allows their use.

TASWORD EINSTEIN Tatung Einstein
disc **£19.95**

TASWORD MSX

With all the features of the Spectrum Tasword Two including the amazing sixty four character per line display. The Tasword MSX machine code program utilises the 32K of memory not normally available to Basic allowing over five hundred lines of text to be held in memory.

TASWORD MSX* 64K MSX Computers
Fully inclusive mail order price **£13.90**
(cassette includes both disc and tape versions)

THE TASCOPY SCREEN COPIERS

The TASCOPY screen copiers print high resolution screen copies with different dot densities and patterns for the various screen colours. This gives the screen copies a shaded effect which presents on a monochrome scale the colours on the screen. With TASCOPY you can keep a permanent and impressive record of your screen pictures and diagrams. TASCOPY supports all the printers mentioned under TASPRINT.

TASCOPY (Spectrum + Interface 1)

The Spectrum TASCOPY is for use with the RS232 output on ZX Interface 1. It produces monochrome copies (in a choice of two sizes) as well as copies with the shaded "grey scale" effect described above.

TASCOPY ZX Spectrum cassette **£9.90**
microdrive cartridge **£11.40**

TASCOPY 464

Adds two new commands to the 464 Basic to give both a standard shaded screen copy as well as a "poster size" copy which is printed onto two or four sheets which can be cut and joined to make the poster.

TASCOPY 464 Amstrad CPC 464 cassette **£9.90**
disc **£12.90**

TASCOPY QL

TASCOPY QL adds new commands to QL Superbasic. Execute these commands to print a shaded copy of the screen contents. Print the entire screen or just a specified window. TASCOPY QL also produces large "poster size" screen copies on more than one sheet of paper which can then be cut and joined to make the poster, and high speed small copies.

TASCOPY QL Sinclair QL
microdrive cartridge **£12.90**

THE TASPRINT STYLE WRITERS

A must for dot-matrix printer owners! Print your program output and listings in a choice of five impressive print styles. The Tasprints utilise the graphics capabilities of dot matrix printers to form, with a double pass of the printhead, output in a range of five fonts varying from the futuristic data-run to the hand writing simulation of Palace Script. A TASPRINT gives your output originality and style! The TASPRINTS drive all Epson compatible eight pin dot-matrix printers, e.g.

AMSTRAD DMP 1
EPSON FX-80
EPSON RX-80
EPSON MX-80 TYPE III
NEC PC-8023B-N
MANNESMANN TALLY MT-80
STAR DMP 501/515
BROTHER HR5
SHINWA CP-80
COSMOS-80
DATAC PANTHER
DATAC PANTHER II

Five impressive print styles for your use:-

COMPACTA - bold and heavy, good for emphasis
DATA-RUN → A FUTURISTIC SCRIPT
LECTURA - clean and pleasing to read
MEDIAN - a serious business-like script
Palace Script - a distinctive flowing font

Typical Tasprint output. Please note that different makes of printer produce different sized output.

TASPRINT (Spectrum)

Drives all the printer interfaces compatible with TASWORD TWO and can be used to print TASWORD TWO text files as well as output from your own Basic programs.

TASPRINT 48K Spectrum cassette **£9.90**
microdrive cartridge **£11.40**

TASPRINT 464

Can be used to print AMSWORD/TASWORD 464 text files in addition to output from your own Basic programs. Drives the Amstrad DMP 1 in addition to the printers listed to the left.

TASPRINT 464 Amstrad CPC 464 cassette **£9.90**
disc **£12.90**

TASPRINT QL

TASPRINT QL includes a screen editor used to modify files created by other commercial software, such as QUILL, or by the user from BASIC. These modified files include TASPRINT control characters and may be printed, using TASPRINT, in one or more of the unique TASPRINT fonts.

TASPRINT QL Sinclair QL
microdrive cartridge **£19.95**

464 MSX · TATUNG EINSTEIN · ZX SPECTRUM · SINCLAIR QL · AMSTRAD CPC 464

oftware?...
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OTHER TASMAN PRODUCTS FOR THE ZX SPECTRUM

TASMERGE

The Mail Merger

Transfer data from MASTERFILE to TASWORD TWO! Letters and forms typed on TASWORD TWO can be printed with addresses and data taken from MASTERFILE. The mail merge facility allows, for example, multiple copies of a letter to be printed, each containing a different name and address taken from your MASTERFILE data. To use TASMERGE you must have one or more microdrives as well as TASWORD TWO and MASTERFILE by Campbell Systems. (version 9 or later).

TASMERGE ZX 48K Spectrum	£10.90

TASWIDE

The Screen Stretcher

With this machine code utility you can write your own Basic programs that will, with normal PRINT statements, print onto the screen in the compact lettering used by TASWORD TWO. With TASWIDE you can double the information shown on the screen!

TASWIDE ZX 16K + 48k Spectrum	£5.50

TASMAN PRINTER INTERFACE

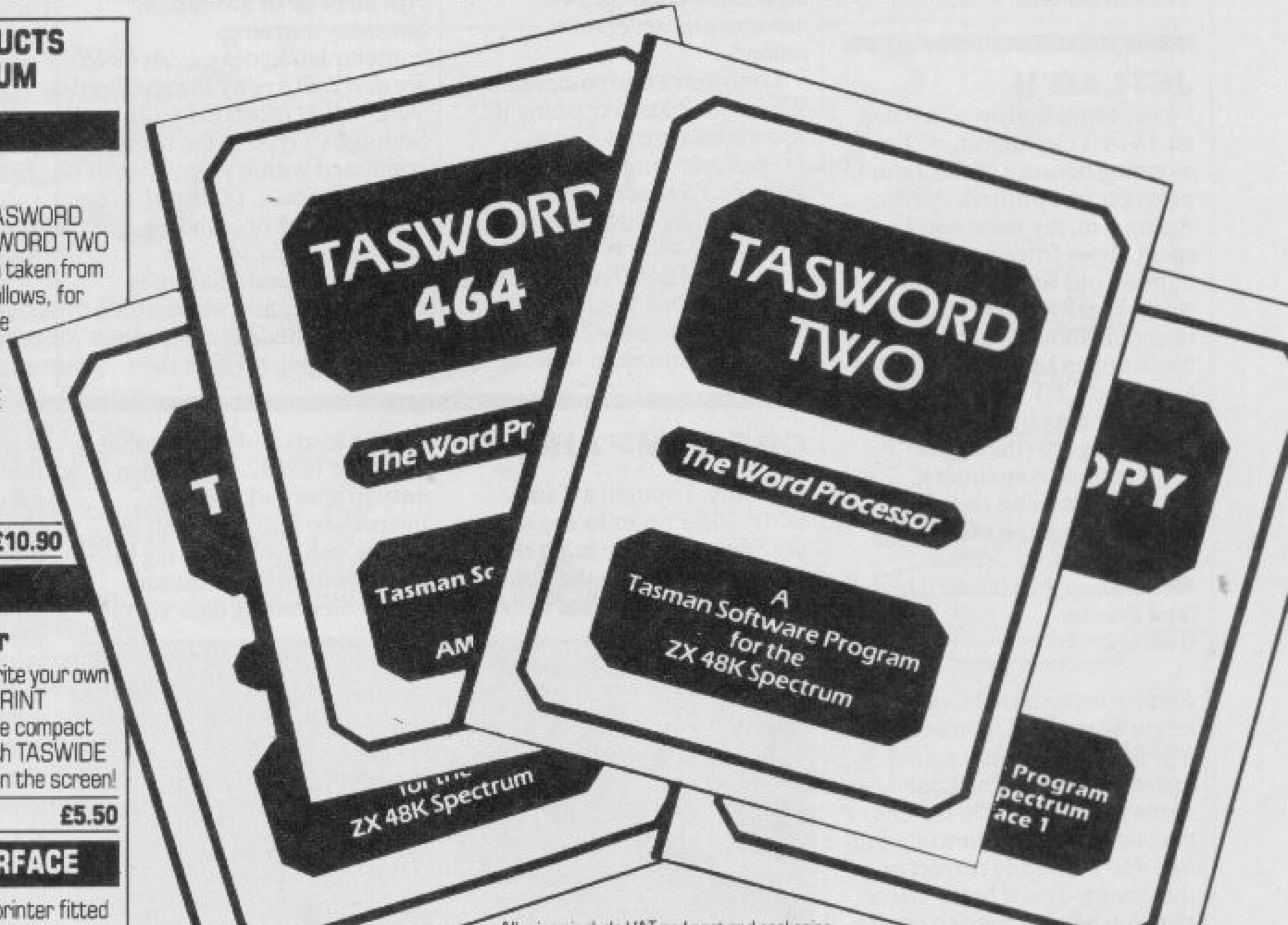
Plug into your Spectrum and drive any printer fitted with the Centronics standard parallel interface. Supplied complete with ribbon cable and driving software. The user changeable interface software makes it easy to send control codes to your printer using the method so successfully pioneered with TASWORD TWO. The cassette contains fast machine code high resolution full width SCREEN COPY SOFTWARE for Epson, Mannesmann Tally, Shinwa, Star, and Tandy Colour Graphic (in colour!) printers.

TASCOPY, shaded screen copy software for this interface (value £9.90 – see description on left) is included in this package.

CENTRONICS INTERFACE ZX Spectrum	£39.90

COMPUTER PRINTER CABLES

RS232 for ZX INTERFACE 1	£14.50
MSX CENTRONICS	£16.00
AMSTRAD CPC 464 CENTRONICS	£9.90



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W+2,Z;"" ‹3 spaces›";INK 0;":"

Secondly, renumber line 1643 to 1642, and then include the new line;

1643 IF ATTR (3,pp*4)=36 AND c$(1)<>"‹graphics M›" THEN GO SUB 1784:RETURN

J Sneideris
Gildersome, Leeds.

Well, we didn't have to wait long for that. I s'pose you're a Jack of all trades. Troubleshootin' Pete.

JETLAG II

I wasn't very happy with issue no.14 of *Your Spectrum*. I'm moaning because of the *Jetman* program you printed. After typing it in, my mate and I spent about fifteen minutes figuring out why it wouldn't work. Finally, after much stompin' about, we found there was a bug in line 460. It should have read LET P=65278. I find your mag by far the best for the Speccy (there is no other serious contender), though it was a bit of a shock after typing in the excellent *MacMan* to find *Jetman*. Please keep the standard high.

Neil Forster
Bedford

Feeling better now? Good. You might have liked Jetman better if you'd typed in our version instead of your own! Your correction to line 460 may have got your program working, but line 460 is already correct in our books. You'd better check that you haven't made a typing error somewhere else in the program, and that your line 460 edit is not just a patch-up. So there! Not very happy ... moaning ... Someone pass me some of the grovelling letters to cheer me up. Troubleshootin! Pete.

THE LAST POKE

At last, I've done it! I've found a POKE to get rid of *Jet Set Willy*!! It's: POKE JET SET WILLY, BIN. And it works.

Mal Goodman
Leeds

Nice one, Mal. We've found a similar POKE for the Ed. It's POKE ED, PUB. Works every time! Troubleshootin' Pete.

WITHDRAWAL SYMPTOMS

Aaaaagh! Disaster! Save me! You've guessed it! Another one back to Sinclair! If I remember rightly that's the fourth one in two years. Another two months without a Speccy! I can't stand it! In December, when I had a Speccy, I sent off for *YS MegaBasic* and on the seventh of Feb, I received a little parcel addressed to me. *(So we got something right then? Ed)* I immediately dashed up half the stairs and hopped up the other after bashing my toe on the wall, gave the Speccy a 9 volt dinner and typed in the famous phrase — none other than LOAD"". I then started the tape and waited for two minutes and seventeen seconds.

I only have one complaint. Why does it keep crashing if you make a mistake on a *MegaBasic* command? *(But I thought YS readers didn't make mistakes. T.P.)* And also, who is George? Why is he waiting?

Anyway, now I must go back upstairs, trying to avoid bashing my toe and lie back in a darkened room to wait for the arrival of my Speccy.

Ian Comerford
Wallasey

Are you sure it was just your toe you bashed? George? Waiting? Will someone explain or I'll start to think it's me who's nuts. Ed.

TOO HOT TO HANDLE?

Not all of us sit around on Saturday mornings contemplating our navels (*well, we don't all live by the sea like you. T.P.*) (*Idiot! Ed.*), Oh, no! Some of us type in the listings contained within your wonderful mag. (*Careful, I can feel an attack of crawling coming on. Ed.*)

On one certain Saturday morning recently while sitting at my MFI budget computer desk, banging away at the rubber keys, I discovered that someone at *YS* had messed around with the UDGs listing on page 17 of the May issue. The last column of this should read 255, 239, 213, 85, 85, 42, 16 and 0.

After altering the data and running the program I was overcome by the fumes from my ZX printer, and what's more, I was rushed into intensive care, but I dare not go into detail over where the tubes where placed. (*Have I missed something here? Ed.*)

As a result I am demanding compensation of either a Porsche 924 or a Trainspotter Award (whichever is the more valuable).

Jon
St Annes-on-Sea

Can there be any doubt about their relative merits! As it is you're not getting either. Ed.

ONE DUMP AHEAD

Recently, I bought a Tandy DMP 105 Printer to use with my Spectrum. The main reason for choosing it was the price (under £200 complete with tractor feed) and the fact that it supports RS232. It was also easy to wire — Tandy's instruction book gives all the details, especially bearing in mind the odd way Sinclair insists on sending data via the RXD line. Anyway, it worked fine first time and it's giving good service.

```
L,
00010 ;  Shade Copy for the
00020 ; TANDY DMP 105 Printer.
00030 ;Adapted from A.Pennell's
00040 ; Routine YOUR SPEC. #4
00050 ;
00060 ORG 50000
00070 ENT
00080 START LD A,27     ;select
00090       CALL OUTCH ;elite
00100       LD A,23     ;chars.
00110       CALL OUTCH ;********
00120       LD A,27     ;set
00130       CALL OUTCH ;small
00140       LD A,91     ;line
00150       CALL OUTCH ;feeds.
00160       LD A,3
00170       CALL OUTCH ; *****
00180       LD A,18     ;Graphic
00190       CALL OUTCH ;*Mode.*
00200 ;
00210 ;Andy's Routine Starts..
00220 ;
00230       LD C,0
00240 NLINE LD B,0
00250 NXY   PUSH BC
00260       CALL #22AA
00270       LD B,A
00280       INC B
00290       LD A,1
00300 L1    RRCA
00310       DJNZ L1
00320       AND (HL)
00330       EX AF,AF'
00340       LD A,H
00350       RRCA
00360       RRCA
00370       RRCA
00380       AND 3
00390       OR #58
00400       LD H,A
00410       LD B,(HL)
00420       EX AF,AF'
00430       LD A,B
00440       JR NZ,INK
00450       RRCA
00460       RRCA
00470       RRCA
00480 INK   AND 7
00490       LD HL,TABLE
00500       ADD A,A
00510       ADD A,A
00520       LD E,A
00530       LD D,0
00540       ADD HL,DE
00550       LD B,3
00560 OUTLP LD A,(HL)
00570       CALL OUTCH
00580       INC HL
00590       DJNZ OUTLP
00600       POP BC
00610       INC B
00620       LD A,B
00630       CP 176
00640       JR C,NXY
00645 ;        ***
00646 ; Andy's routine ENDS
00650       LD A,30     ; Char.
00660       CALL OUTCH ; Mode.
00670       LD A,13     ;   Do
00680       CALL OUTCH ;   C/R
00690       LD A,18     ; Graph
00700       CALL OUTCH ; Mode
00710       INC C       ;CONT.
00720       JR NZ,NLINE
00730       LD A,30     ;Char.
00740       CALL OUTCH ;Mode.
00750       LD A,27     ;Reset
00760       CALL OUTCH ; to
00770       LD A,91     ;Twelve
00780       CALL OUTCH ; dot
00790       LD A,12     ;line
00800       CALL OUTCH ;Feeds
00810       LD A,27     ;set to
00820       CALL OUTCH ;Std.
00830       LD A,19     ;Char.
00840       CALL OUTCH ;set
00850 END   RET
00860 TABLE DEFB 135 ; Black
00870       DEFB 135
00880       DEFB 135
00890       DEFB 0
00900       DEFB 131 ; Blue
00910       DEFB 134\
00920       DEFB 131
00930       DEFB 0
00940       DEFB 133 ; Red
00950       DEFB 130
00960       DEFB 133
00970       DEFB 0
00980       DEFB 134 ; Magenta
00990       DEFB 128
01000       DEFB 134
01010       DEFB 0
01020       DEFB 132 ; Green
01030       DEFB 130
01040       DEFB 129
01050       DEFB 0
01060       DEFB 130 ; Cyan
01070       DEFB 128
01080       DEFB 130
01090       DEFB 0
01100       DEFB 128 ; Yellow
01110       DEFB 130
01120       DEFB 128
01130       DEFB 0
01140       DEFB 128 ;white
01150       DEFB 128
01160       DEFB 128
01170       DEFB 0
01180 OUTCH PUSH BC
01190       PUSH HL
01200       RST 8       ; CALL
01210       DEFB #1E    ; RS232
01220       POP HL
01230       POP BC
01240       RET
```

My only problem was that I didn't have a hi-res dump program, so remembering Andy Pennell's *Dumps of Distinction* in issue 4, *(how could anyone forget it? Ed)* I decided to have a crack at the necessary modifications.

The main problem is that Tandy in their wisdom only allow for 7 dot feeds in graphics mode. However, in character mode you can select as few or as many as you need. So, it's necessary to select the elite mode and adjust for 3 dot line feeds before changing the printer to graphics and entering the routine. Then returning to text mode *before* doing a line feed and back to graphics prior to doing the next line. That done, the bit pattern for printing needs to be flipped and have bit 7 set (ie. add 128).

The assembler listing shown is a Zeus dump of my efforts.

Finally, may I join the ranks of many readers to congratulate you on your excellent magazine. It is without question, in my humble opinion, full of useful and interesting information, programs and reviews.

Derrick Lambert
New Milton, Hants.

C'mon, cut the crawling. I dunno, some people will say anything to get into print. Since when has a YS reader had a humble opinion? Still, one bit of useful and interesting info is that Dumps of Distinction *is this month celebrating its first birthday! Celebratory champagne may be sent to the usual address. Ed.*

COMPETITION

CHOPPER PATROL

Cop a load of this. Virgin Games has come up with the amazing offer of a helicopter trip for three. Chop, chop!

That's right, Your Super Soaraway Spectrum is offering three lucky readers the chance to fly in a chopper over London. Imagine it! The blades whirring overhead, and London — St Paul's, Parliament, Westminster Abbey and the Thames — set out beneath you like a map. You'll be aloft for an hour on this trip of a lifetime. How many people d'you know who've been in a 'copter, let alone flown right over the heart of the capital?

Take-off will be from Battersea Heliport in a four-seater Jet Ranger. Then it's up, up and away. For the next hour you'll see a side of London that very few people have ever viewed. And to make sure it's a day you'll never forget, Virgin will feed you and pay for your train travel to the smoke.

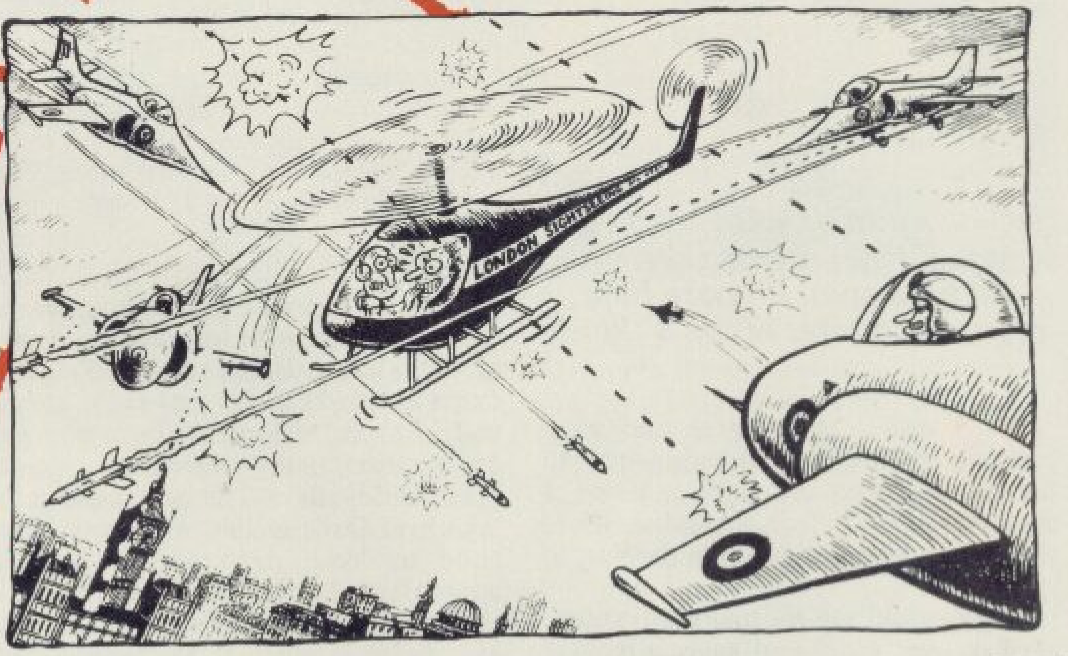
VIRGIN TERRITORY

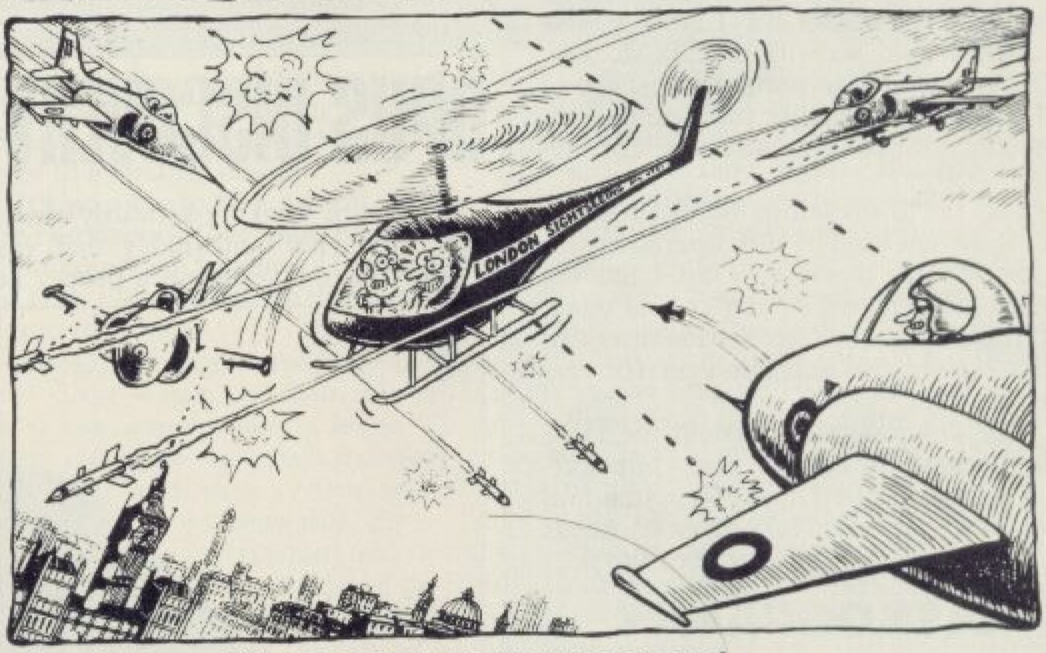
So, what's prompted this magnificent munificence on Virgin's part. Well, they want to tell you about their new Speccy game Falcon Patrol II which features three different types of helicopter. The only problem is that your task in the game is to shoot 'em down from your fighter plane. But then it would be pretty tricky arranging for a jaunt out in a jump jet! And just as difficult shipping you over to the desert for the day to where FP II takes place.

Finally, to show that their generosity knows no bounds, Virgin is also offering ten runners-up a Fly Virgin bag and T-shirt, Virgin calculator and a copy of their Speccy game, Strangeloop.

SPOT ON!

All you have to do is look at the two pictures, then ring each difference on the coupon cartoon. Once you've completed the rest of the coupon, jot down the number of differences you found on the back of an envelope and send the lot off to Virgin Copter Compo, Your Spectrum, 14 Rathbone Place, London W1P 1DE. Now that shouldn't present any problems for all you Trainspotters out there, should it?





I spotted .... differences between the two cartoons!

Name..

Address..

..

..

.. Postcode..................

Now post this coupon pronto to Virgin Copter Compo, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

MAGAZINE HEALTH WARNING
If you're for the chop but don't want to chop up your copy of YS, use a photocopy instead!

VIRGIN RULES OK!

Entries for the Virgin Copter Compo must be post-dated no later than 31st July 1985. Each entry form must have the number of differences between the two cartoons clearly written on the back of the envelope.

The Editor's decision is final and no correspondence will be entered into regarding this competition.

Under no circumstances can Troubleshootin' Pete enter this competition unless he gives an undertaking to jump out of the helicopter without a parachute.

DiSKO TECH

Get the low-down on hi-tech. YS disk jockey, Iolo Davidson takes two new disk drives out for a spin. Prepare for a close encounter of the 3" kind!

Mention disk drives and most people's minds immediately turn to thoughts of speed, but that's only one of the advantages. In fact, some disk drives won't even give you much in the way of speed.

Some would say *the* major advantage of disk over tape, and especially over stringy-floppy tape cartridges (and they're pretty fast anyway), is the greater reliability and security of data storage. This is at least as important as fast access if you're using the disk for business — a loading error could mean financial disaster.

The third advantage of disks is the filing system used by disk operating systems. It's true that stringy tapes, like the Microdrive, have a similar kind of thing, so this isn't exclusively an advantage of disk, but you certainly don't get it on cassette.

The disk operating system, or DOS (you realise, of course, that some software houses, like Digital Research and Microsoft, are also DOS houses!), keeps a DIRectory or CATalogue of the programs or data files on each disk. You can use the DIR or CAT (Speccy uses CAT), command to see what's on a disk, and the other DOS commands allow you to SAVE, LOAD or ERASE files, without having to manually operate rewind, play and record controls. It's this that makes the real difference — it's quick and easy for your programs to use the disk to store and retrieve data — and not just the sheer speed of disk loading.

The Spectrum disk drives we're looking at here share all the above advantages, though to varying degrees. The only real drawback is the price. Its not *too* much to pay for what you get, but it's still a lot of cash to splash out on what's supposed to be a peripheral. You probably ought to think twice about stumping up the readies if you're really only interested in nothing more than world record non-stop *JSW* marathons.

You Spin Me Round ...

Both these drives use the new smaller size disks, rather than the industry standard 5 ¼" workhorse. But it's not so long ago that the standard size was eight inches, and 5 ¼s were reckoned to be toys, so pay no attention to any dinosaur who pooh-poohs diddy disks. The new sizes, in the region of three inches, are every bit as good as 'real' disks, except for the amount of storage available per disk. Problem is, these three inchers cost at least twice as much as Microdrive cartridges or 5 ¼ inch disks, and sometimes a fair bit more.

Perfection is unobtainable anywhere in the known universe (*When did you last visit Castle Rathbone? Ed.*), but I've seen nearer misses than these two. Certainly, both drives are more reliable than the Microdrive, but neither DOS offers much improvement on the arduous Microdrive syntax. If you already have one of Sinclair's little brown stringy spoolers (and assuming that it works for you), then suffer on — there's no point forking out again for something slightly better. Also, you can't connect disks and Microdrives at the same time, because the shadow ROMs clash.

But, and it's a big but, if you're still using cassette and need more speed, or if your Microdrives treat you like they treat me, then either of these machines will give you fast storage and more reliability than Microdrives at only double the price.

Transferring your own programs to disk is a doddle, but the commercial software that's designed to be copied to Microdrive or Wafadrive, is still going to give problems.

Now, there are plusses and minuses on both drives. Of the two, I'd put my money on the Opus as it has more storage on line at one time and the extra interfaces. The Triton would fit different keyboards more easily, it didn't hum or overheat, and it was faster, despite a rather dodgy DOS. But, despite all my griping, these are both good products, not just the toy for the boy whose Dad has everything!

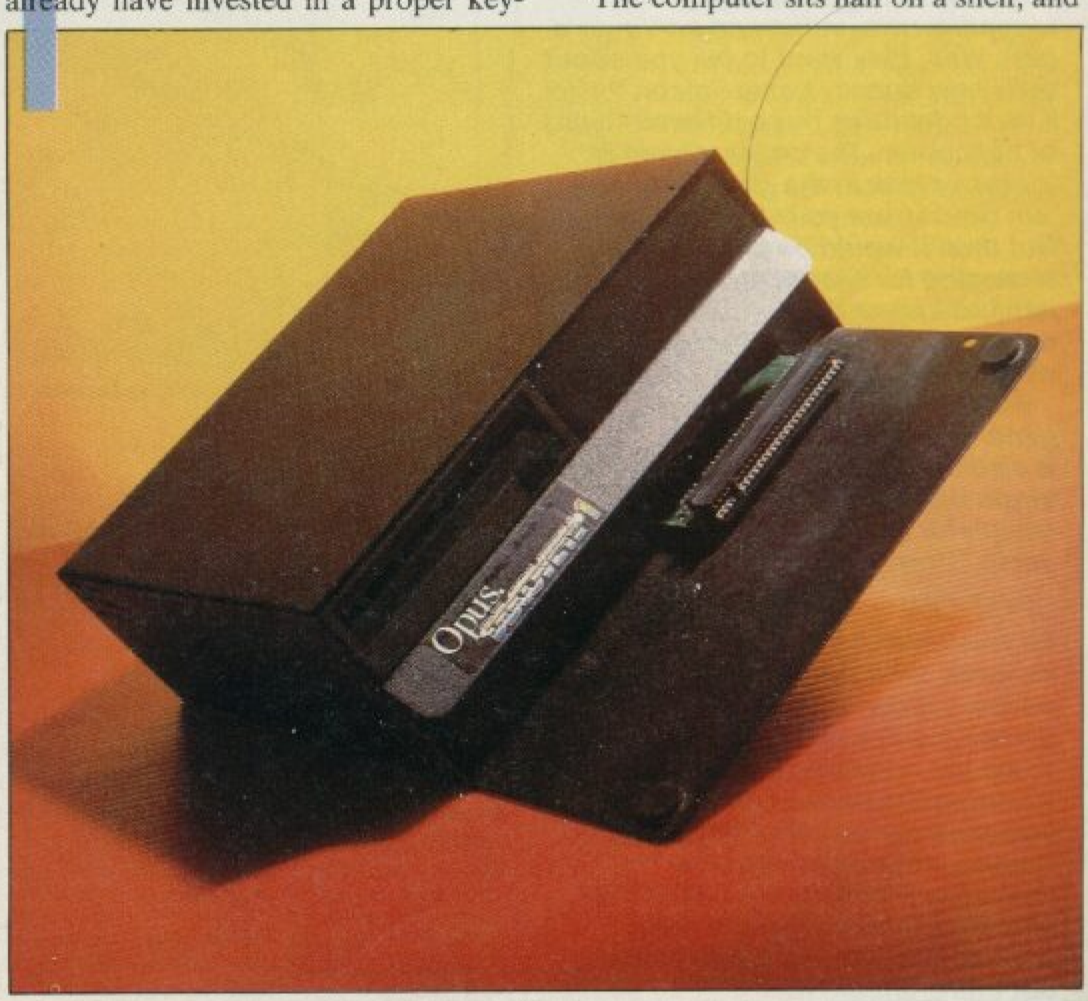
DISKOGRAPHY

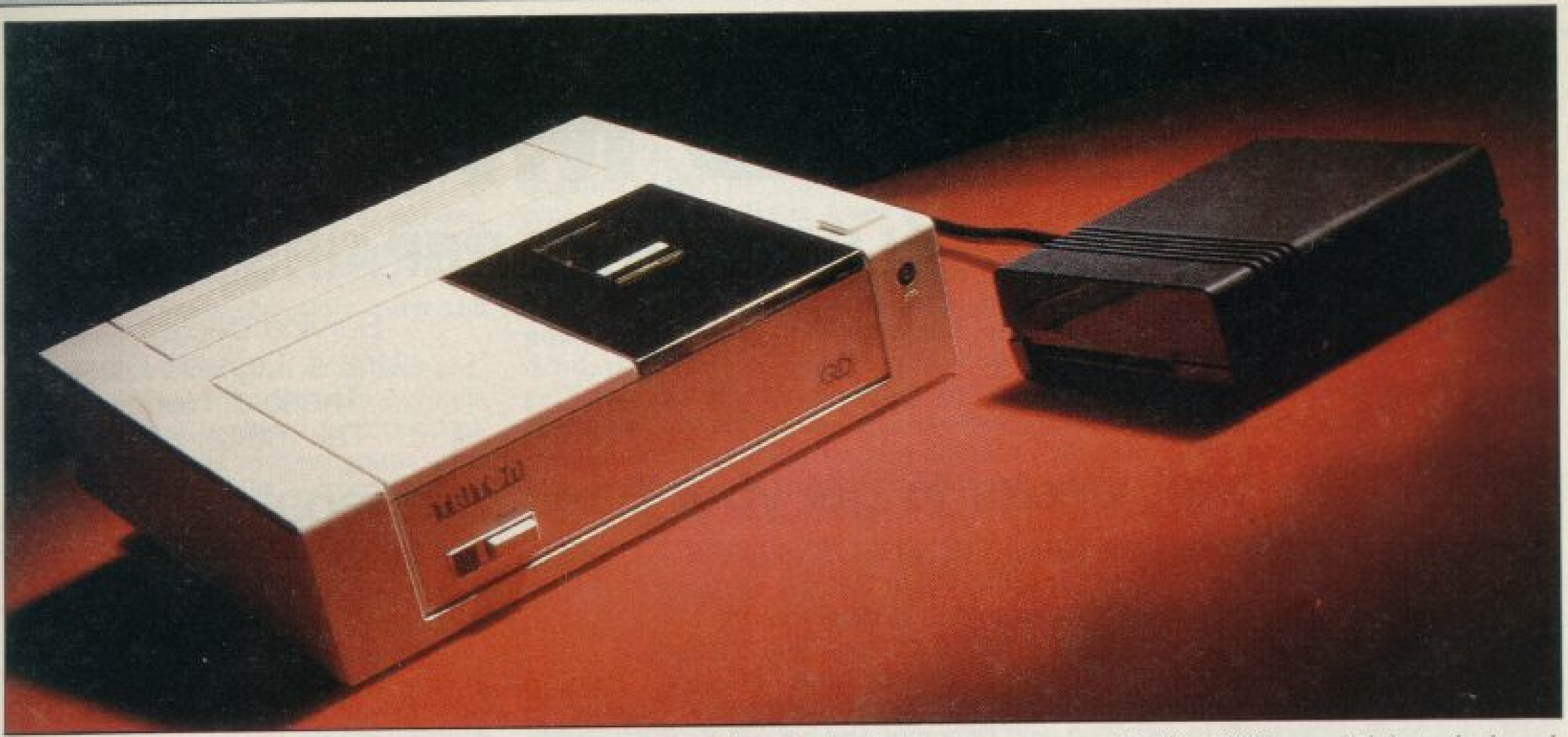
Drive	Opus Discovery 1	Triton QD
Storage per side	178K	100K
Storage per side	178K	50K
Auto-Verify On Save	No	Yes
No. Files per side	No limit	20
Simplest case Syntax	LOAD *1; "name"	LOAD *1; "name"
Price	£199.95	£119.95
Disk Type	3½" Sony	3" Top-loading
Through connector	Yes	Yes
Other Interfaces	printer and Joystick	None

OPUS DISCOVERY 1

If you're thinking seriously about a disk drive, it's quite likely that you'll already have invested in a proper keyboard — and no, I don't mean a Plus. Well, that's where you're going to hit the first snag with the Opus *Discovery* — it's constructed in such a way that the use of these add-on keyboards is extremely tricky.

The computer sits half on a shelf, and





TRITON QD

QD stands for quick disk, a name given to the top-loading 3" version of the minidisk drive. This isn't the same as the Hitachi designed 3" disk used on the Amstrad, which is front loading and has a protective shutter. The top-loader is less widely used than the Sony or Hitachi type, so you may have trouble tracking down the disk — a point to bear in mind.

There's nothing intrinsically wrong with the smaller disk, but there are differences. One is that the drive has a flip-up door that you slide the disk into and then shut, just like on a standard cassette tape machine. You turn the disk over to see the other side, again like a cassette. There's no sliding shutter to protect the magnetic surface.

More importantly, the 3" quick disk is generally capable of less storage than the 3½" though this does depend partly on the drive mechanisms. The Triton's 50K per side for 100K per disk is typical, and compares with Opus's 178K per disk. This limits the amount of storage that you can have active at any one time to, say, one large arcade game.

The Triton file directory is more informative than that of the Opus, with info on file type (Basic, Code or Data), start address and size. Pretty essential stuff, this.

After that advance on the Discovery, the QD starts slipping back. There are no interfaces for printers or joysticks, only a

you're supplied with a pair of stick-on feet to support the rest of the machine. Without the feet, you're magically transported back to the ZX81 days of Rampack wobble and white-out. There's a single fixing screw sited to suit both the Spectrum Plus and the orginal Speccy, but most add-on keyboards won't have a convenient hole in the right place. Some keyboard upgrades mount the computer's circuit board too high from the keyboard's base, so that there's not enough room between the connector and the shelf on the Opus to fit the computer.

The practical solution to the problem is to buy an extension ribbon cable to connect the two units — but that costs money, (unless you pinch the one from your VTX 5000 modem!). Some kind of flexible connection should've been a part of the original design, as it is for the Triton QD. This would've also made it much easier to get at the tape and TV sockets, which are otherwise jammed tight against the Discovery's case under the shelf.

While I'm whining, suppose I'd better mention the Opus's power supply. The one on our review machine sure makes a bit of a hum. The drive itself is quieter than the Triton's, but the transformer providing the power is on all the time.

Overheating's also a slight problem. It doesn't get dangerously hot, but with the case removed, I still found the transformer too hot to touch. I have a hunch that it was chosen for its ability to fit in the box rather than its output current rating. It's a very tight fit, jammed as it is between the bottom of the case and the actual drive. The problem is that fitting a more capable unit would've probably meant going over to a circular design.

It's possible to fit a second drive into the Discovery 1 (or rather, have Opus fit it) whereupon it becomes a Discovery 2. I do hope that they uprate the transformer at the same time.

The Discovery uses the Sony-designed 3½" disks — just feed them into the slot as if you were posting a letter. To get them out again, you press the eject button. This is a slick system and great improvement on large disk drives that require the manual opening and shutting of a 'door'. To use both sides of this kind of disk, the drive must have two heads, as you can't flip the disk over to get to the other side. The Discovery has only the one head, so the capacity of each disk is about 178K — half of what it could have been if both sides were used — but that's still more per disk than the Triton.

You also get a good selection of expansion options with the Discovery. There's a joystick port, parallel printer output, composite video socket and a through connection for hooking your other peripherals to the Speccy edge connector.

Unfortunately, the video output is in black and white only, and the printer port has an edge connector instead of a proper Centronics socket. The printer connection works in input as well as output, so you can use it to hook two Spectrums together — provided they both have Discovery 1 attached, of course.

The DOS commands are mostly identical to those of the Microdrive. The bad news is that the Microdrive has a tortuous command syntax. But the good news is that this awkward syntax means Microdrive software works on the disks without alteration, provided it uses Basic for saving and loading. Machine code tricks using hook codes won't work, as the Discovery shadow ROM is different from the Microdrive's.

Programs that have the facility to transfer to Microdrive 'should transfer to disk in exactly the same way' (it says here). The only program I own with that facility is *Superchess 3.5* and it doesn't transfer, probably because it tries to do it in machine code. HiSoft's *Devpac* can save assembly language programs created with *Devpac* to Microdrive, and this also didn't work.

The CAT command gives you a Microdrive-like catalogue, with just the names and amount of storage left on the disk. Not a patch on the Triton's comprehensive directory.

The command syntax differs from Microdrive in one rather neat way, as it defaults to the "m" channel. This means that you can save four keyboards by omitting the "m"; (including the quotes and the semi-colon) in the LOAD *"m";1;"name" command. This is also the case with SAVE *, ERASE and so on.

The Opus manual's a neat little production and shows that the Discovery hasn't been rushed into the market.

TRITON QD

through connection for the Spectrum edge connection, which you're told to use only for the ZX Printer *or* another Trition QD. Mind you, I did manage to connect a Kempston interface — it doesn't fit properly physically, but it's all right electrically.

The command syntax is neither usefully identical to the Microdrive syntax, nor a simplification. It's different enough to be incompatible with programs using Microdrive commands, but just as much of a chore to type. Some disk commands cannot be used within a program, and other must have a line to themselves. There's a default to the disk (there are no Microdrive type channels anyway) which disposes of the "m", but you must add a type specifier for Basic, Code and Data when saving.

Plus, there's lots of opportunities for operator error built-in. You must *not* power-up the Spectrum before the disk drive, you must *not* touch the (hair-trigger) eject button during a disk access, you must *not* access the disk continuously more than three times without a few seconds rest. In an ideal world, these mistakes would be made impossible by the hardware or operating system — not left as pitfalls for the user to avoid.

If you've got the gelt, you can buy another QD and chain the edge connectors to run two disks at once. This'll probably be more expensive than adding a second disk to the Discovery, and it'll certainly take up a lot more disk space, as you can't stack a top-loading unit.

The QD has its DOS in ROM and uses the printer buffer as workspace when loading and saving, so very little memory is used by the disk system. Most software shouldn't have any trouble with space, unless it has some of its own code in the printer buffer, like some tape copiers do.

OPUS DISCOVERY 1

Trouble is it just doesn't contain all the info required. It's good on the command structure you'll need to use the machine from Basic (in fact, better than the Microdrive manual at explaining some things), but it doesn't tell you about the amount and location of RAM used for disk and other channels and streams. This seems to be similar to the Microdrive system, with the DOS in shadow ROM and chunks of memory being inserted between the systems variables and the Basic program for print channels and so on. It seems though, that merely loading a file doesn't move the start of Basic like it does with Microdrives, but you're not told.

You're also given all sorts of info and sample listings for using the joystick in your own programs. But the one item of info that you're acually going to need is that you should select the Kempston option from a game's joystick menu. Again, they haven't divulged this.

Finally, one last added attraction. The Discovery can set aside the top half of the Spectrum memory as a RAM disk. This allows disk commands to be used on DATA files at memory access speeds without waiting for disk reads, once the files have been downloaded to the RAM disk. This is a pretty powerful technique when used on big 'PC' type micros with huge memories and although the Spectrum doesn't have a lot of room for the program when you have the RAM disk active, it's still good to have.

TIME TABLE

Drive	Opus Discovery 1	Triton QD
Format Time	20 sec	9 sec
CAT Time	2 sec	3 sec
SAVE 35K Time	20 sec	15 sec
LOAD 35K Time	20 sec	7 sec
Erase 35K Time	3 sec	10 sec

Pipped at the Post Script

We'd hoped to include the Crescent Quick Disk in this review, but there was only a prototype in existence at press time, and Crescent was reluctant to let us have a go at it, as it's still under development. They've been advertising since February, and presumably accepting orders. Well, it's happened before. Let's hope they get their act together soon.

3D DAZE

It's here — the ultimate in 3D graphics. Mr MegaBasic, Mike Leaman shows another side to his talents with a program that'll transport you into the third dimension.

How often have you wished you could create the smooth three dimensional graphics like the ones Ultimate has made famous in *Knightlore* and *Alien 8*? Well, now you can — almost. Of course, the Ultimate team doesn't actually program on the Spectrum but on a much larger machine, then squirts it down. But you can get pretty close with these machine code routines that'll enable you to move objects in three dimensions.

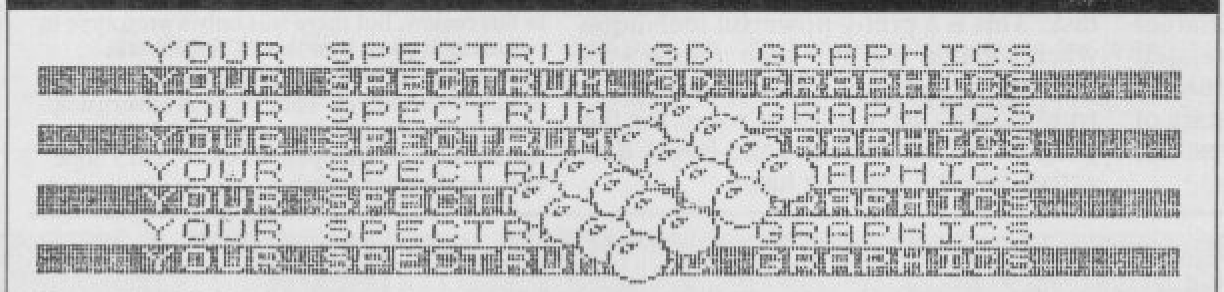
The tricky bit about 3D graphics is making sure that the objects meant to be at the front of the display look as though that's where they are. So, how's it done? Well, briefly, you have to draw the objects at the back first and then work your way forward.

I've tackled it by keeping a list of all the objects that appear on the screen and this list contracts and expands according to how many objects there are. The list starts at 64700 and each entry consists of four bytes. Understanding these is the tricky bit. The first byte is the 'X' co-ordinate, the second the 'Y' co-ordinate, the third the 'Z' co-ordinate and the last byte is the objects' code number. The easiest way to understand these co-ordinates is to think in terms of a matchbox — hold it up in front of you. 'Y' runs along the bottom from left to right, 'X' runs up the edge that goes from the top to bottom and 'Z' is the co-ordinate that travels along the edge that's going away from you. If you're still in trouble or you want to go into further depth, take a look at the articles on 3D plotting in *YS* issues 2 and 3.

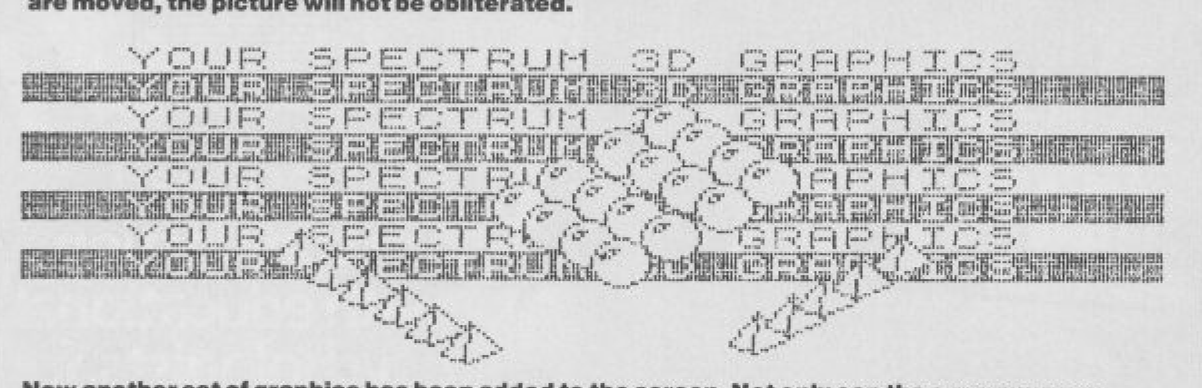
Now back to that list. Those objects that are to be placed at the back come at the start of the list. Then each time an object is displayed or erased, the list is scanned and the appropriate action taken. The shape of each object is stored in 64 bytes of RAM and I've included three objects with the code. The shape list starts at 65047, so that's where you'll find the first object, then the second object is at 65047+64 and so on. The 64 bytes of character info is split into two halves — the first 32 bytes represent the actual shape of the object, similar to the way you would define a UDG but with much more information because of the third dimension. This is followed by the second 32 byte block that describes the shape of the mask needed to erase the object.

Now take a look at the code. It's in two parts — the first part that does all the work starts at 64000 and the second part contains shape info for the three example objects and starts at 65047. Here's how you enter the code. First type in the Hex loader and save it — you may need it later. Now RUN it and it'll automatically lower RAMtop so that there's space for the code. You'll then be asked for a start address — for the main block, enter 64000 and for the shape info enter 65047. Once you've put those in, you can press on with entering the actual code. For starters, you'll be prompted with an

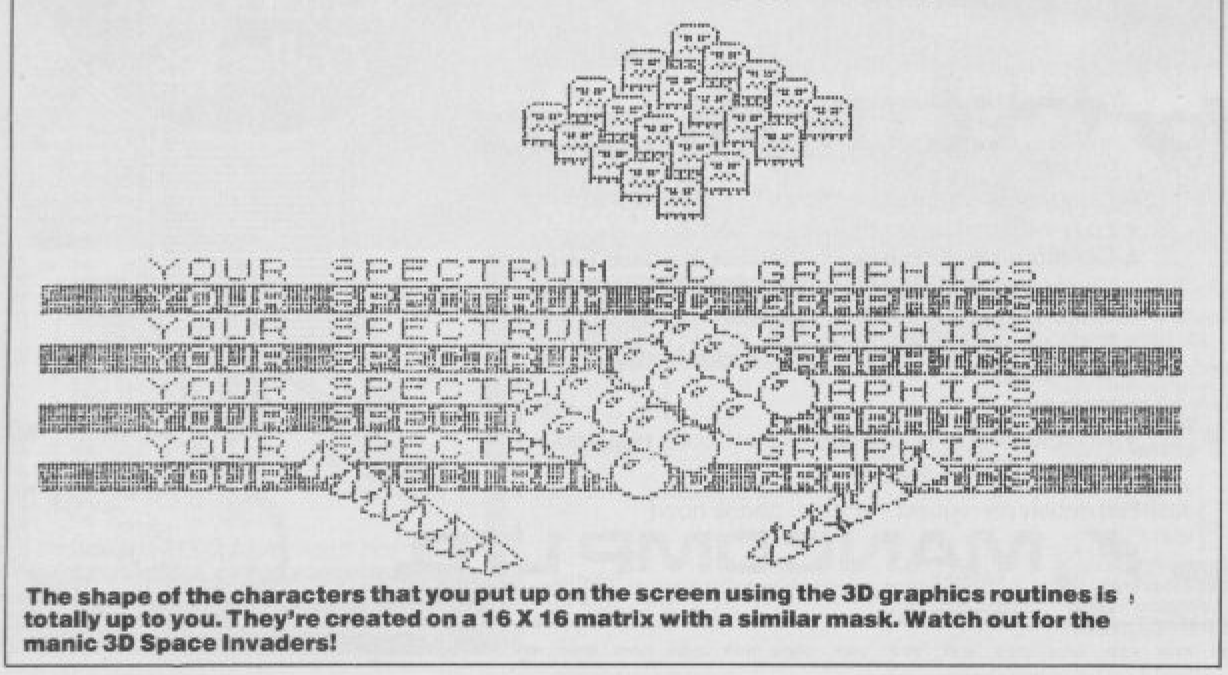
A NEW DIMENSION



Memories of Knightlore come flooding back already. Here's the first of Mike's 3D graphics emulator. The background's been stored already in high memory so that once the characters are moved, the picture will not be obliterated.



Now another set of graphics has been added to the screen. Not only can the program cope with the spheres going back into the picture but also with graphics coming forward.



The shape of the characters that you put up on the screen using the 3D graphics routines is totally up to you. They're created on a 16 X 16 matrix with a similar mask. Watch out for the manic 3D Space Invaders!

address — look at the main listing — the first prompt'll be 64000 so you should enter F3. The second prompt is 64001, so you'll enter CD93FB, remembering, of course, not to enter any spaces.

When you've reached the end of a block, enter 'S' — the loader will then ask you for a Checksum. For the main block enter 79933, then for the shape data enter 17774. Now the loader checks the code for errors. If it finds one you'll just have to go back and re-check. As soon as you've entered the main block, carry on and enter the shape data and then save the code using:

SAVE "code" CODE 64000,1368

Now enter NEW and type in the test program, again remembering to save it just in case the code crashes. At last, you're there! If all's well, you should be greeted by a number of bubbles moving across the screen in full and glorious 3D.

OK, I can already hear you asking how you can use the routines yourself. As I've said, it takes four parameters to describe an object — the 'X', 'Y' and 'Z' co-ordinates plus the shape code that defines what shape the object is to take. These parameters are passed to the machine code in four locations:

64637 'Y' co-ordinate
64638 'X' co-ordinate
64639 shape code
64640 'Z' co-ordinate

Well, there are three routines that you can usefully adapt. The first is the one that covers the background. To understand this, you must know that the middle third of the screen is printed first, so you can use this part as a back drop. So, design your back drop and save it into memory which you can do as follows: first, reserve an area of memory using the CLEAR command, then POKE the address of this area into locations 64635 and 64636. Once you've drawn your backdrop, call the routine at 64423 and this'll save the middle third of the screen into memory.

Now to print an object POKE its co-ordinates into the correct memory locations and call the routine at 64489. Then to erase an object POKE its co-ordinates into the correct locations and call the routine at 64556.

This program's on Digi'T'ape – see page 57

HEX LOADER

Use this Hex loader to enter the hex code from both the character info and the main assembler listing.

```
 10 CLEAR 63999
 15 POKE 23658,8
 17 DEF FN H(H$)=16*(CODE (H$)-48-7*(H$(1)>"9"))+
(CODE (H$(2))-48-7*(H$(2)>"9"))
 20 INPUT "Start address ";a
 25 LET Z=A
 30 INPUT (a), LINE a$
 35 IF A$="S" THEN  GO TO 90
 40 PRINT a,a$: POKE 23692,255
 50 FOR Z=1 TO LEN A$/2
 60 POKE a,FN H(a$(((z*2)-1) TO )): LET a=a+1
 70 NEXT z
 80 GO TO 30
 90 INPUT "CHECKSUM:";D
100 LET C=0: FOR B=Z TO A-1: LET C=C+PEEK B: NEXT B
110 IF C=D THEN  PRINT "The code is OK!": STOP
120 PRINT "Oh dear , the code is incorrect": STOP
```

ASSEMBLER 3-DUMP

This is the main assembler listing, which you can either type in using an assembler, monitor or our own Hex loader.

This program's on Digi'T'ape – see page 57

```
64000  F3           DI
64001  CD 93 FB     CALL 64403
64004  DD 21 BC FC  LD IX,64700
64008  DD 7E 03     LD A,(IX+3)
64011  A7           AND A
64012  28 1E        JR Z ,64044
64014  CD 32 FA     CALL 64050
64017  AF           XOR A
64018  DD 6E 00     LD L,(IX+0)
64021  DD 66 01     LD H,(IX+1)
64024  DD 56 02     LD D,(IX+2)
64027  DD 23        INC IX
64029  DD 23        INC IX
64031  DD 23        INC IX
64033  DD 23        INC IX
64035  DD E5        PUSH IX
64037  CD 6B FA     CALL 64107
64040  DD E1        POP IX
64042  18 DC        JR 64008
64044  FD 21 3A 5C  LD IY,23610
64048  FB           EI
64049  C9           RET
64050  3D           DEC A
64051  26 00        LD H,0
64053  6F           LD L,A
64054  29           ADD HL,HL
64055  29           ADD HL,HL
64056  29           ADD HL,HL
64057  29           ADD HL.HL
64058  29           ADD HL,HL
64059  29           ADD HL,HL
64060  01 17 FE     LD BC,65047
64063  09           ADD HL,BC
64064  44           LD B,H
64065  4D           LD C,L
64066  C9           RET
64067  3E BF        LD A,191
64069  90           SUB B
64070  47           LD B,A
64071  21 00 40     LD HL,16384
64074  78           LD A,B
```

```
64075  E6 C0        AND 192
64077  1E 00        LD E,0
64079  57           LD D,A
64080  CB 3A        SRL D
64082  CB 3A        SRL D
64084  CB 3A        SRL D
64086  19           ADD HL,DE
64087  78           LD A,B
64088  E6 07        AND 7
64090  84           ADD H
64091  67           LD H,A
64092  78           LD A,B
64093  E6 38        AND 56
64095  CB 27        SLA A
64097  CB 27        SLA A
64099  5F           LD E,A
64100  16 00        LD D,0
64102  19           ADD HL,DE
64103  06 00        LD B.0
64105  09           ADD HL,BC
64106  C9           RET
64107  32 8B FB     LD (64395),A
64110  E5           PUSH HL
64111  C5           PUSH BC
64112  DD E1        POP IX
64114  21 20 00     LD HL,32
64117  09           ADD HL,BC
64118  E5           PUSH HL
64119  FD E1        POP IY
64121  E1           POP HL
64122  CD 6B FB     CALL 64363
64125  F5           PUSH AF
64126  CD 47 FB     CALL 64327
64129  C1           POP BC
64130  4F           LD C,A
64131  E6 07        AND 7
64133  32 8C FB     LD (64396),A
64136  6F           LD L,A
64137  26 00        LD H,0
64139  29           ADD HL,HL
64140  29           ADD HL,HL
64141  29           ADD HL,HL
64142  C5           PUSH BC
64143  01 0E FB     LD BC,64270
64146  09           ADD HL,BC
64147  C1           POP BC
64148  36 C9        LD (HL),201
```

```
64150  22 91 FB     LD (64401),HL
64153  79           LD A,C
64154  CB 3F        SRL A
64156  CB 3F        SRL A
64158  CB 3F        SRL A
64160  4F           LD C,A
64161  32 8D FB     LD (64397),A
64164  78           LD A,B
64165  32 8E FB     LD (64398),A
64168  CD 43 FA     CALL 64067
64171  06 10        LD B,16
64173  3A 8E FB     LD A,(64398)
64176  C5           PUSH BC
64177  E6 07        AND 7
64179  FE 07        CP  7
64181  20 07        JR NZ,64190
64183  ED 4B 8D FB  LD BC,(64397)
64187  CD 43 FA     CALL 64067
64190  FD 46 00     LD B,(IY+0)
64193  FD 4E 01     LD C,(IY+1)
64196  16 FF        LD D,255
64198  CD 0D FB     CALL 64269
64201  E5           PUSH HL
64202  7E           LD A,(HL)
64203  A0           AND B
64204  77           LD (HL),A
64205  23           INC HL
64206  7E           LD A,(HL)
64207  A1           AND C
64208  77           LD (HL),A
64209  23           INC HL
64210  7E           LD A,(HL)
64211  A2           AND D
64212  77           LD (HL),A
64213  FD 23        INC IY
64215  FD 23        INC IY
64217  E1           POP HL
64218  3A 8B FB     LD A,(64395)
64221  A7           AND A
64222  20 1C        JR NZ,64252
64224  E5           PUSH HL
64225  DD 46 00     LD B,(IX+0)
64228  DD 4E 01     LD C,(IX+1)
64231  16 00        LD D,0
64233  CD 0D FB     CALL 64269
64236  78           LD A,B
64237  B6           OR  (HL)
```

```
64238  77           LD (HL),A
64239  23           INC HL
64240  79           LD A,C
64241  B6           OR  (HL)
64242  77           LD (HL),A
64243  23           INC HL
64244  7A           LD A,D
64245  B6           OR  (HL)
64246  77           LD (HL),A
64247  DD 23        INC IX
64249  DD 23        INC IX
64251  E1           POP HL
64252  3A 8E FB     LD A,(64398)
64255  3D           DEC A
64256  32 8E FB     LD (64398),A
64259  24           INC H
64260  C1           POP BC
64261  10 A9        DJNZ 64176
64263  2A 91 FB     LD HL,(64401
64266  36 CB        LD (HL),203
64268  C9           RET
64269  5A           LD E,D
64270  CB 3B        SRL E
64272  CB 18        RR  B
64274  CB 19        RR  C
64276  CB 1A        RR  D
64278  CB 3B        SRL E
64280  CB 18        RR  B
64282  CB 19        RR  C
64284  CB 1A        RR  D
64286  CB 3B        SRL E
64288  CB 18        RR  B
64290  CB 19        RR  C
64292  CB 1A        RR  D
64294  CB 3B        SRL E
64296  CB 18        RR  B
64298  CB 19        RR  C
64300  CB 1A        RR  D
64302  CB 3B        SRL E
64304  CB 18        RR  B
64306  CB 19        RR  C
64308  CB 1A        RR  D
64310  CB 3B        SRL E
64312  CB 18        RR  B
64314  CB 19        RR  C
64316  CB 1A        RR  D
64318  CB 3B        SRL E
```

You'll also have to remember to execute POKE 64703,0 before you start printing — that way you'll clear the display list. And finally a word of warning — so that the routine's as fast as possible I've left out all the error checking. You'll have to make sure that none of your 3D objects goes wandering off the edge of the screen or you may find yourself with a system crash.

And now onto next month. Watch out for a 3D graphic designer that'll let you create your own clockwork mice or mutant daleks. Plus, for all the clever people who've mastered *YS MegaBasic*, I'll be showing you how to convert this month's machine code into MegaBasic. All you'll have to use then are a number of new Basic commands. Of course, all you poor socially deprived Speccy owners still relying on Sinclair Basic will have to resort to the infamous commands POKE and USR. It's a tough life!

THREE D-EMONSTRATION

Once you've entered all the code, here's the program that'll give you the moving picture show. Just type it in and then RUN it. Back row of the stalls, please.

```
 10 BORDER 0: PAPER 0: INK 6: CLEAR 63999
 25 POKE 64703,0
 30 FOR y=0 TO 30 STEP 10
 40 POKE 64637,y: POKE 64638,0: POKE 64639,1:
POKE 64640,0
 50 LET print=USR 64489
 60 NEXT y
 70 FOR y=0 TO 30 STEP 10
 80 FOR x=0 TO 162 STEP 3
 90 POKE 64637,y: POKE 64638,x
100 LET erase=USR 64546
110 POKE 64638,x+3: LET print=USR 64489
115 PAUSE 2
120 NEXT x
130 NEXT y
140 FOR y=0 TO 30 STEP 10
150 FOR x=165 TO 3 STEP -3
160 POKE 64637,y: POKE 64638,x
170 LET erase=USR 64546
180 POKE 64638,x-3: LET print=USR 64489
185 PAUSE 2
190 NEXT x: NEXT y
200 GO TO 70
```

CHARACTER INFORMATION

This is the character info used by the main listing for the graphics displayed in 3D. These are stored in 64 bytes, 32 bytes for the shape and another 32 for the mask.

```
65047**03 C0 0C 30
65051**10 08 27 04
65055**2A 04 4C 02
65059**40 02 40 02
65063**40 02 20 04
65067**20 04 10 08
65071**0C 30 03 C0
65075**00 00 00 00
65079**FC 3F F0 0F
65083**E0 07 C0 03
65087**C0 03 80 01
65091**80 01 80 01
65095**80 01 C0 03
65099**C0 03 E0 07
65103**F0 0F FC 3F
65107**FF FF FF FF
```

```
65111**00 80 01 C0
65115**01 A0 02 90
65119**04 88 08 84
65123**09 02 11 01
65127**21 06 31 18
65131**0F 60 01 80
65135**00 00 00 00
65139**00 00 00 00
65143**FF 7F FE 3F
65147**FE 1F FC 0F
65151**F8 07 F0 03
65155**F0 01 E0 00
65159**C0 01 C0 07
65163**F0 1F FE 7F
65167**FF FF FF FF
65171**FF FF FF FF
```

```
65175**00 00 07 F0
65179**08 08 10 04
65183**17 74 13 64
65187**10 04 12 A4
65191**15 54 10 04
65195**10 04 1F FC
65199**15 54 00 00
65203**00 00 00 00
65207**FF FF F8 0F
65211**F0 07 E0 03
65215**E0 03 E0 03
65219**E0 03 E0 03
65223**E0 03 E0 03
65227**E0 03 E0 03
65231**EA AB FF FF
65235**FF FF FF FF
```

ASSEMBLER 3-DUMP

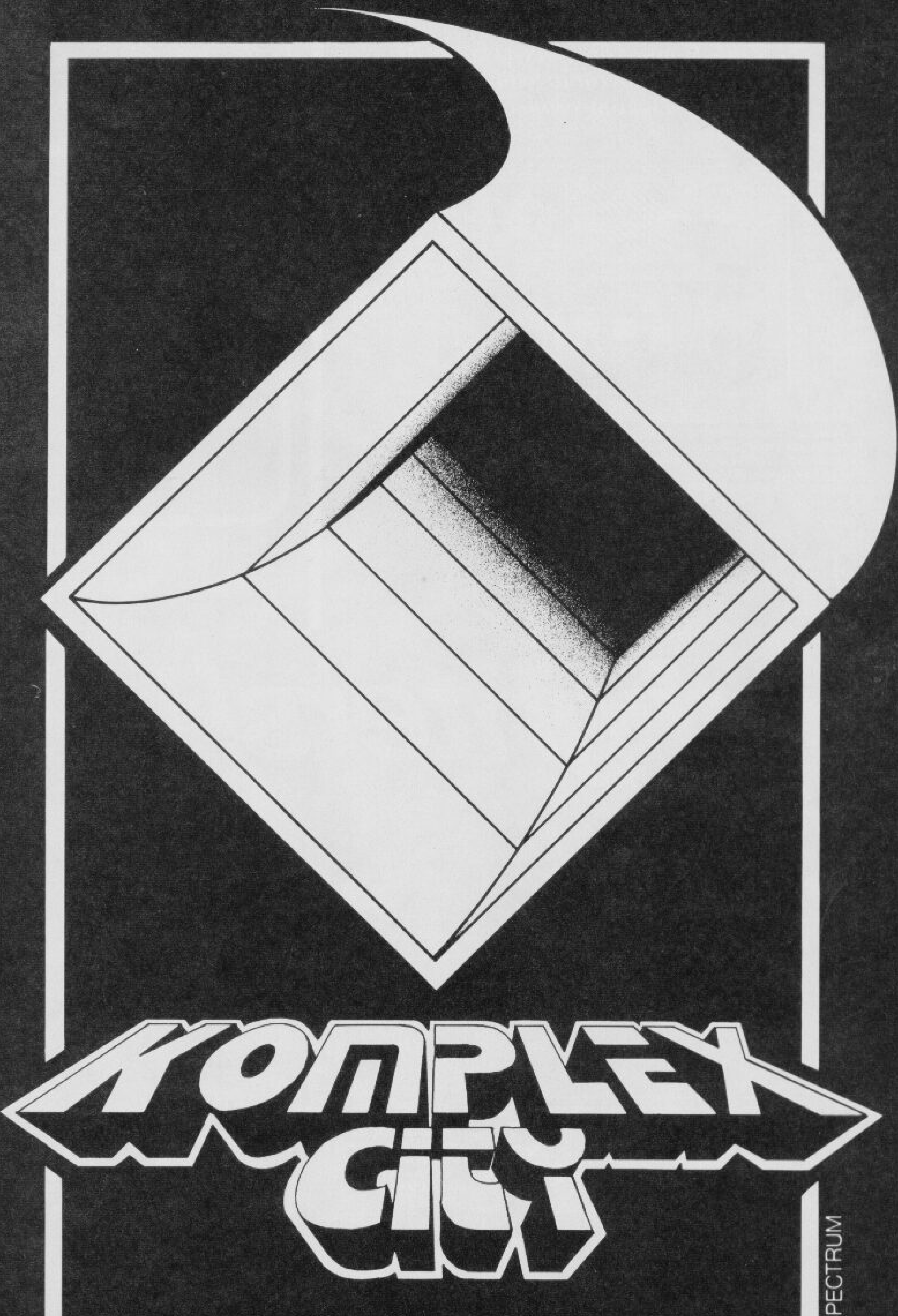
```
64320  CB 1B        RR  B
64322  CB 19        RR  C
64324  CB 1A        RR  D
64326  C9           RET
64327  C5           PUSH BC
64328  D5           PUSH DE
64329  E5           PUSH HL
64330  5C           LD E,H
64331  26 00        LD H,0
64333  E5           PUSH HL
64334  29           ADD HL,HL
64335  C1           POP BC
64336  09           ADD HL,BC
64337  CB 3C        SRL H
64339  CB 1D        RR  L
64341  CB 3C        SRL H
64343  CB 1D        RR ' L
64345  CB 3B        SRL E
64347  7D           LD A,L
64348  83           ADD E
64349  F5           PUSH AF
64350  CB 3F        SRL A
64352  E1           POP HL
64353  84           ADD H
64354  67           LD H,A
64355  3A 8F FB     LD A,(64399)
64358  84           ADD H
64359  E1           POP HL
64360  D1           POP DE
64361  C1           POP BC
64362  C9           RET
64363  C5           PUSH BC
64364  D5           PUSH DE
64365  E5           PUSH HL
64366  5C           LD E,H
64367  26 00        LD H,0
64369  E5           PUSH HL
64370  29           ADD HL,HL
64371  C1           POP BC
64372  09           ADD HL,BC
64373  CB 3C        SRL H
64375  CB 1D        RR  L
64377  CB 3C        SRL H
64379  CB 1D        RR  L
64381  CB 3B        SRL E
```

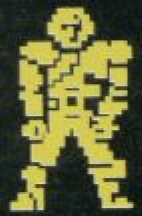
```
64383  7D           LD A,L
64384  93           SUB E
64385  82           ADD D
64386  67           LD H,A
64387  3A 90 FB     LD A,(64400)
64390  84           ADD H
64391  E1           POP HL
64392  D1           POP DE
64393  C1           POP BC
64394  C9           RET

64395**00 00 00 00
64399**00 28 00 00
64403  2A 7B FC     LD HL,(64635)
64406  11 00 48     LD DE,18432
64409  01 00 08     LD BC,2048
64412  1A           LD A,(DE)
64413  B6           OR  (HL)
64414  12           LD (DE),A
64415  13           INC DE
64416  23           INC HL
64417  0B           DEC BC
64418  78           LD A,B
64419  B1           OR  C
64420  20 F6        JR NZ,64412
64422  C9           RET
64423  ED 5B 7B FC  LD DE,(64635)
64427  21 00 48     LD HL,18432
64430  01 00 08     LD BC,2048
64433  ED B0        LDIR
64435  C9           RET
64436  DD 21 BC FC  LD IX,64700
64440  DD 7E 03     LD A,(IX+3)
64443  A7           AND A
64444  C8           RET Z
64445  DD 7E 01     LD A,(IX+1)
64448  B9           CP  C
64449  28 0B        JR Z ,64462
64451  D0           RET NC
64452  DD 23        INC IX
64454  DD 23        INC IX
64456  DD 23        INC IX
64458  DD 23        INC IX
64460  18 EA        JR 64440
64462  DD 7E 00     LD A,(IX+^
```

```
64465  B8           CP  B
64466  28 04        JR Z ,64472
64468  30 0A        JR NC,64480
64470  18 EC        JR 64452
64472  DD 7E 02     LD A,(IX+2)
64475  BA           CP  D
64476  30 02        JR NC,64480
64478  18 E4        JR 64452
64480  DD 23        INC IX
64482  DD 23        INC IX
64484  DD 23        INC IX
64486  DD 23        INC IX
64488  C9           RET
64489  ED 4B 7D FC  LD BC,(64637)
64493  ED 5B 7F FC  LD DE,(64639)
64497  C5           PUSH BC
64498  D5           PUSH DE
64499  CD B4 FB     CALL 64436
64502  DD E5        PUSH IX
64504  D1           POP DE
64505  21 2F FD     LD HL,64815
64508  E5           PUSH HL
64509  A7           AND A
64510  ED 52        SBC HL,DE
64512  44           LD B,H
64513  4D           LD C,L
64514  11 33 FD     LD DE,64819
64517  E1           POP HL
64518  03           INC BC
64519  ED B8        LDDR
64521  D1           POP DE
64522  C1           POP BC
64523  DD 70 00     LD (IX+0),B
64526  DD 71 01     LD (IX+1),C
64529  DD 72 02     LD (IX+2),D
64532  3A 7F FC     LD A,(64639)
64535  DD 77 03     LD (IX+3),A
64538  AF           XOR A
64539  32 33 FD     LD (64819),A
64542  CD 00 FA     CALL 64000
64545  C9           RET
64546  ED 4B 7D FC  LD BC,(64637)
64550  ED 5B 7F FC  LD DE,(64639.
64554  DD 21 BC FC  LD IX,64700
64558  DD 7E 03     LD A,(IX+3)
```

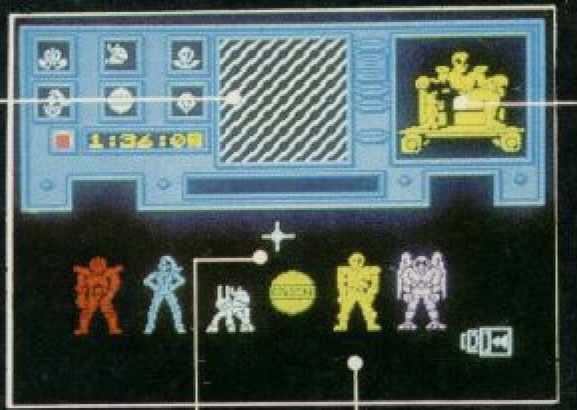
```
64561  A7           AND A
64562  C8           RET Z
64563  78           LD A,B
64564  DD BE 00     CP  (IX+0)
64567  20 0C        JR NZ,6458J
64569  79           LD A,C
64570  DD BE 01     CP  (IX+1)
64573  20 06        JR NZ,64581
64575  7A           LD A,D
64576  DD BE 02     CP  (IX+2)
64579  28 0A        JR Z ,64591
64581  DD 23        INC IX
64583  DD 23        INC IX
64585  DD 23        INC IX
64587  DD 23        INC IX
64589  18 DF        JR 64558
64591  DD 7E 03     LD A,(IX+3)
64594  CD 32 FA     CALL 64050
64597  C5           PUSH BC
64598  21 2F FD     LD HL,64815
64601  DD E5        PUSH IX
64603  D1           POP DE
64604  ED 52        SBC HL,DE
64606  44           LD B,H
64607  4D           LD C,L
64608  62           LD H,D
64609  6B           LD L,E
64610  23           INC HL
64611  23           INC HL
64612  23           INC HL
64613  23           INC HL
64614  ED B0        LDIR
64616  C1           POP BC
64617  3A 7D FC     LD A,(64637)
64620  67           LD H,A
64621  3A 7E FC     LD A,(64638)
64624  6F           LD L,A
64625  3A 80 FC     LD A,(64640)
64628  57           LD D,A
64629  3E 01        LD A,1
64631  CD 6B FA     CALL 64107
64634  C9           RET
64635**00 48 00 00
64639**00 00
64641  00           NOP
```


KOMPLEX CITY
LEGEND
48K SPECTRUM



"I, Zark Montor, have been chosen by our beloved Emperor to lead the Enigma team on its rescue mission. Follow me ..."

This window gives you an overview of your position in the Spaceship but the shutters are drawn until you choose a character to move. To the left, the clock counts down the hundred minutes until the hostage cops it. You can carry on after that time but you can't complete the game.



All hail — it's the Emperor who oversees your mission to rescue Ambassador Kryxix held hostage on the spaceship. When you've chosen a member of the Enigma team from the line-up below, his or her picture will appear in this window.

This is the first adventure that breaks the language barrier — it's completely icon-driven. Move the cursor over the picture you wish to choose and click — you'll be surprised at how quickly you build up speed at it. When you want to change screens move the cursor to the icon in the right-hand corner.

This is the Enigma team — and you'd have to look far and wide in the universe before you'd come across a more 'orrible looking bunch of mercenaries. Crooks, trained killers and cut-throats to the man, and woman. (*Looks a bit like the YS team to me. Ed.*)



***Steve:** Four minutes in, and we still haven't decided who goes where yet. I'm gonna choose Manto, as he can use the transporter. I think we should beam down just two or three.*

***Ross:** I just hope you've fully armed them all before sending them to the ship. I'd take Sevrina, Maul and Zork to clear the way — but I'm not holding the joystick so anything could happen!*

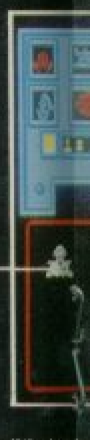


"I am Syylk, the muscle on this mission. And that's gonna come in pretty handy at the moment as we've just cornered Captain Churl ..."



***Steve:** It's al... the monkey, b... we should be ... grinder? The ... here and we'r... precious time...*

This is the attack screen — in this section you'll see just who you're up against. This is Sky Fortress Captain Churl, second-in-command to General Zoff. Luckily, he's on his tod and can put up little resistance but you won't be able to duff 'em all over this easily.



Sevrina can open all the doors bu... if she meets a sticky end? Th... find that the master pass-card ... comes in handy — it's the p... have to colour co-ordinate...



Firefighters!



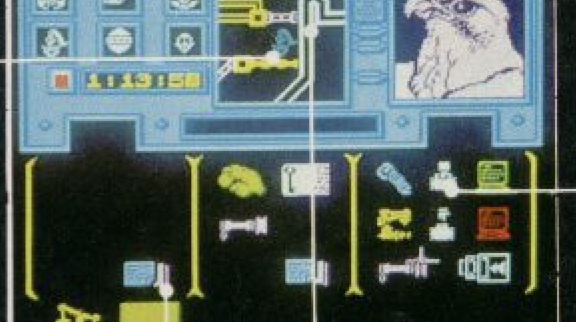
***Steve:** This is another fine mess you've got me into. If we'd only done it my way, we wouldn't have ended up with forty minutes left on the clock and nowhere to go. Aaargh!*

***Ross:** Don't you start blaming me. We did do it your way. There's a first and last time for everything and this is the first and last time I play this game with you. Humph!*



"The name's Torik. And before anyone says this mission's failed because I'm bird-brained, I'm winging my way out of here."

This is one of the three starting points that Manto can beam you up to. There are plusses and minuses to all of them so it's just a question of trial and error. At this stage of the game, now that Manto's copped it, there's no chance of saving the Ambassador.



Keep track of where you are by making a note of your current location. But be warned — if the word 'security' is in there, you're likely to have big trouble with the bad guys.

The movement arrows work in the same way as the attack arrows — you can only travel in the direction of the filled in ones. Quite often you'll come up against locked doors, so either Sevrina will have to open them or you'll need the correct coloured pass-card.

It's a space shuttle — not that it'll do you a lot of good now. Your mission's finito!

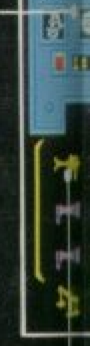


"Brrr...phtt.-..zzz...Name: Maul...Statu-s: Weapons droid...Dam-age: Limited... phtt...zzz..."



***Steve:** What... not gonna lik... They're just th... battles at clo... words, we'll... Security sec... them.*

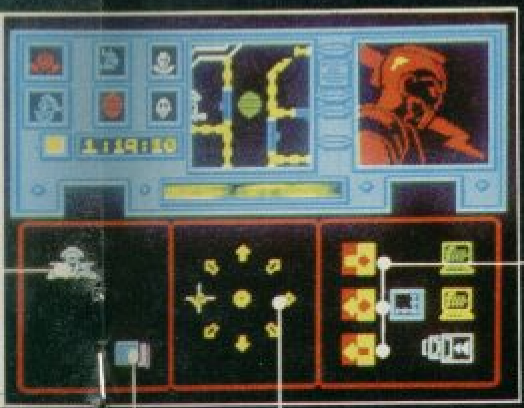
Keep a constant check on the status of the six members of the Enigma team. Blue means they're on the move, magenta on the attack, cyan defending, yellow retreating, flashing indicates a character's weak and if the box is empty ... RIP!



These are the grenades that... you'll need for close conta... want to test his theory you... but don't be surprised if...

…ve: *It's all very well going for … monkey, but don't you think … should be after the organ … der? The Ambassador ain't … e and we're just wasting … cious time.*

Ross: *It's not a waste of time — if we're going to crack this we've got to explore everywhere. Look, we've found the master pass-card here that'll give us access to all the locked doors on the ship.*



These are the three action icons — top is attack and advance, middle is stand and attack and the bottom is retreat. To help you choose the best course of action use the icon on the right of them — it lets you look around to see if the enemy's ganging up.

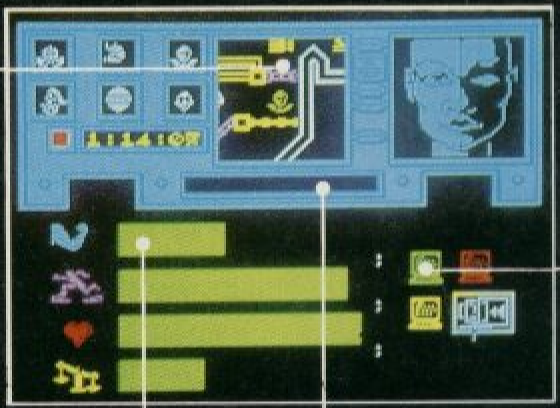
…ll the doors but what happens … ticky end? That's when you'll … ter pass-card in Churl's office … ly — it's the pass that doesn't … ur co-ordinate with the doors.

You can only attack or retreat in the direction of the filled-in arrows. The order of combat is to choose one of the action icons on the right and then one of these arrows to direct your attack.



"Sevrina's the name. There is no lock I cannot unpick, no door I cannot pass through and no man who can match me ..."

The map window shows the area in the immediate vicinity of your chosen character. Here's Sevrina about to unpick the lock on a door, a knack that'll come in very useful during the game. Just in view at the top of the picture is the icon for an enemy trooper waiting to go on the offensive.



The three telly icons give you immediate access to the other screens. Green takes you to the movement screen, yellow to the object screen so you can see what you're carrying and red to the attack screen.

These four bars give an indication of strength, speed, stamina and the weight of any objects you're carrying. The quickest way to reduce strength is to get into scraps with the enemy but luckily resting aids recovery. Also if you carry too much, the weight bar will go into the red and make you more vulnerable.

If any of the characters comes under attack, you'll learn the bad news here first. Obituary notices will also be posted here!



Steve: *We're very close to the robot armoury here so we can stock up on weapons. As soon as Sevrina opens the door let's start legging it ...*

Ross: *For once I agree with you! This is a tricky spot but if we move in enough fire power we can wipe the floor with this bunch. But we'll have to put a spurt on before they regroup.*



Light the blue touch paper and stand back for ... Shadowfire, the new firework from Beyond. It's a real-time adventure without words — you have just 100 minutes to board the enemy's space ship, rescue the hostaged ambassador, capture General Zoff, the enemy leader, and then destroy his ship. And all without typing so much as one piece of text. So, the YS fire brigade of Ross Holman and Steve Malone prepared to play with fire...

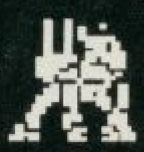


Steve: *Didn't I say we should've brought Torik, the explosives expert along? We've found the self-destruct but we can't trigger it and we can't pick it up. Any more bright ideas?*

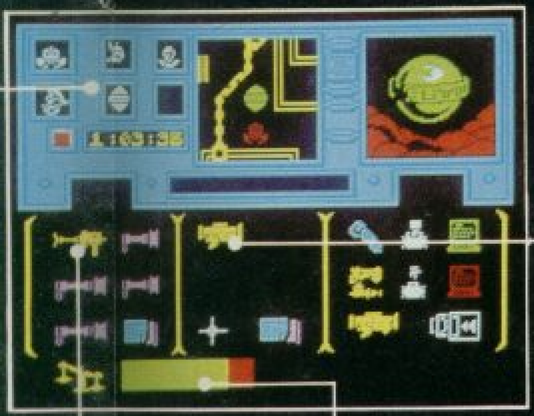
Ross: *Just shows what you know. We don't need to pick it up — all we have to do is collect the self-destruct card from Zoff's office and then any character can set it off. So there!*

…ve: *What d'you mean you're … gonna take the grenades? … y're just the business for … tles at close quarters. Mark my … rds, we'll never get out of the … urity section alive without … m.*

Ross: *That rocket launcher's worth any number of your puny grenades — just look at how heavy it is! If we're going to get into Zoff's office we'll need all the fire power we can muster.*



"Look I'm just here to carry the transporter ... stand back. Just don't leave me alone or I won't make it through — and neither will you ..."

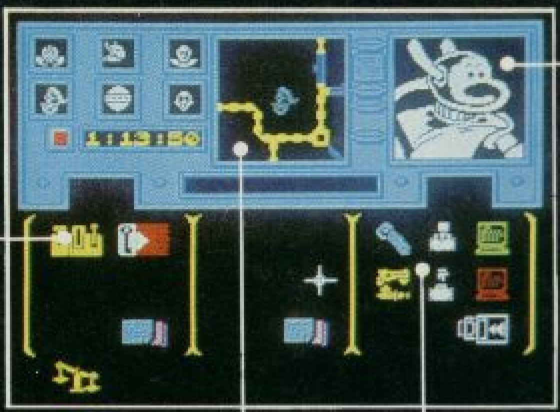


Any object displayed here is being carried by your character. You'll often stumble across weapons on your travels but it's better to stay armed at all times than take the risk of finding something suitable when you need it.

…nades that Steve's so adamant … se contact clobbering — if you … heory you'll have to give it a go … urprised if they blow up in your face.

When you pick up a weapon, look at the weight bar — it'll give you a good idea of how powerful it is. The heavier the better, of course, but make sure you don't overstretch your team member.

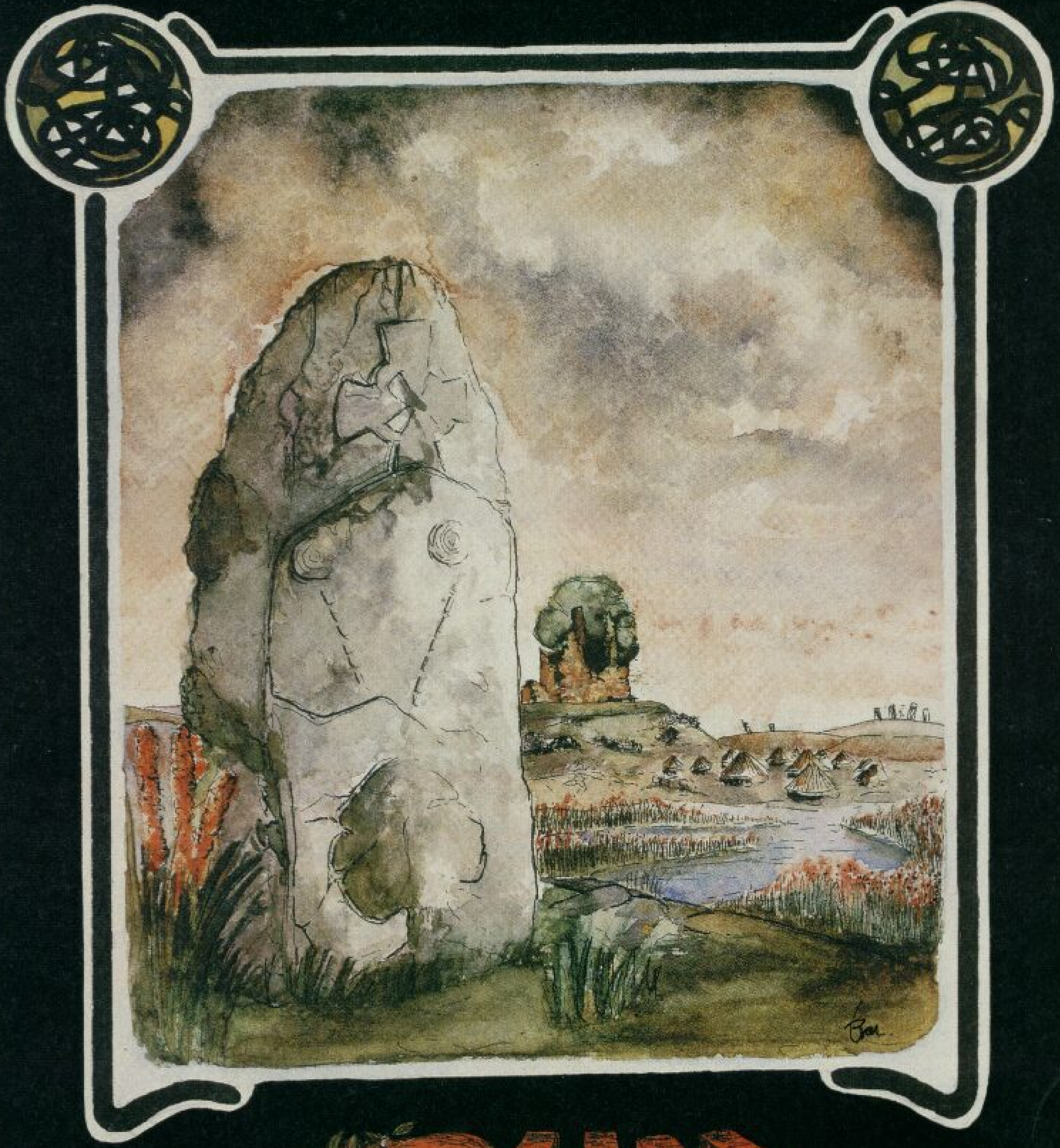
All the objects to be found in your present location are displayed here — most of them can be picked if they're not too heavy but this one's the exception. It's the destruct unit that'll blow the ship to smithereens.



Here's the big piccy of your current character — in this case Manto. It's worth learning their names pretty quickly 'cos when a message comes through that they're under attack you've got to move fast.

It's worthwhile keeping your own detailed map of the spaceship or you may end up hopelessly lost — even with our blueprint.

Use these four icons on the object screen to handle your weapons and so on. You can pick up objects and drop them just so long as they're not too heavy for you. Also, make sure you've got a weapon 'in hand' before trying to use it or you're likely to come unstuck.



DUN DARACH

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HACKER'S GUIDE

The hairy hacker, *Dave Nicholls* is back. Join the prying man as he jumps into *Shadowfire*.

Most hackers are constantly on the lookout for new products that'll make their lives easier (*so, who isn't? Ed*). More often than not, these are special disassemblers, or monitors with extra features that can cope with the 'strange' situations brought about by the latest protection techniques. While hacking *Shadowfire* I found that there was one item in particular that helped me enormously but the strangest thing is, it hasn't been released yet! It's the *Shadowfire Tuner* that's scheduled to hit the streets later this year. With it, you'll be able to modify the program to suit your own taste.

Now, I haven't been slipped a pre-pre-production copy or anything like that — it's just the fact that it's coming out, has forced the *Shadowfire* programmers to be extra neat with their coding. They've placed all the useful info into tables that can be changed by the Tuner. This means, of course, that once you've sussed out what the table's are for, it's easy to see what each piece of code is doing, just by noting the table it accesses.

The program contains four main tables — one for the objects, one for the locations, and two character tables, divided into one for the Enigma team and one for the rest. These last two tables are in the same format, with 9 bytes for each character. Each entry describes the location of the characters (and where they're going if they're on the move), what they're up to, and gives the complete gen on the state of their health. After a quick count-up of the entries, I reckon there are nigh on 42 independent characters wandering about.

In the object table each entry has 5 bytes — one byte handles the info on how heavy it is, two bytes give the address of the routine that handles the object, one byte gives its position (if it's being carried then the number of the character becomes its location) and the final byte gives variable info about the state of the object as the game progresses.

The location table is a touch more tricky. It consists of one table of two byte address entries which 'point' to a location where further info can be found. This is done because each of the different rooms has a different number of exits and such like, so each one takes up a different amount of space. So much cleverer than the method used in, say, *Jet Set Willy*, *(Nope, I shan't say it — you can't make me. Ed)* where each room uses the same amount of space even if it's empty.

The coding in *Shadowfire*'s a pretty professional job — it uses interrupts to keep everything moving at once, and it's all nicely laid out, though there are a few unexplained gaps in the middle. Is the *Tuner* going there perhaps? If it's not, then the space could've been used to expand on the current 165 locations.

Shadowfire certainly offers plenty of scope for POKEs. In fact, by the time the *Tuner* makes a showing, it'll probably be out-of-date. Well, just to get the ball rolling, here's my program!

```
100 LET c=0
110 FOR x=23296 TO 23435
120 READ y: POKE x,y: LET c=c+y
130 NEXT x
140 IF c<>14868 THEN  PRINT "Checksum error !!
!": STOP
150 PRINT "Now insert Shadow Fire tape"
160 RANDOMIZE USR 23296
1000 DATA 243,49,240,95,17,144,1,221
1010 DATA 33,64,156,62,7,55,205,86
1020 DATA 5,48,241,33,64,156,6,255
1030 DATA 205,123,91,6,255,205,123,91
1040 DATA 33,82,156,1,144,1,22,165
1050 DATA 205,130,91,62,201,50,93,156
1060 DATA 205,82,156,33,0,128,34,105
1070 DATA 251,62,201,50,120,251,205,78
1080 DATA 251,33,0,96,1,124,146,126
1090 DATA 237,103,35,11,120,177,32,247
1100 DATA 33,0,96,1,124,146,22,82
1110 DATA 205,130,91,33,16,167,34,54
1120 DATA 92,33,0,0,34,27,131,34
1130 DATA 237,130,62,255,33,21,127,6
1140 DATA 6,119,35,16,252,237,86,251
1150 DATA 195,3,129,126,237,103,35,16
1160 DATA 250,201,126,170,119,35,11,120
1170 DATA 177,32,247,201
```

To move more quickly and carry as much as you want, type this in, save to tape and run it. When you're prompted, insert Shadowfire and press play. Shadowfire's an enigma no longer!

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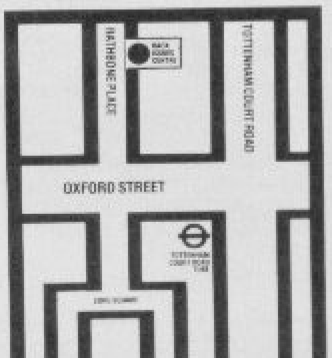
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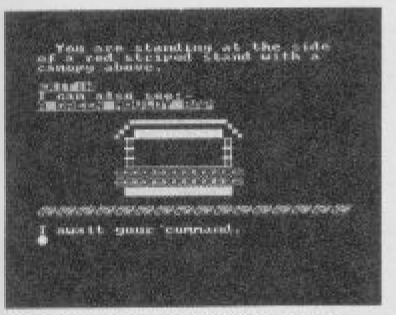
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The aliens have landed and snatched Dave Nicholls's body — they obviously forgot their glasses! But it's OK, he's grabbed it back in time to go walkabout in Ashkeron.



Smother mouldy, green bap with mouldy, green mustard and throw at mouldy old vendor! (Tee-hee!)

FUNHOUSE
Pacific Software/£3.99

This game's a real body snatcher — once it's got a hold on you it'll be difficult to throw it off.

It is night in an abandoned amusement park when an alien spaceship crash lands. But instead of dashing around on the dodgems and whirling on the Waltzer, these aliens have a much more sinister aim. They gradually take over the surrounding neighbourhood, kidnapping all the inhabitants. Now, controlling them is a central brain (*sounds a bit like YS — we couldn't afford one each. Ed*) and it's your task to destroy it. At least it makes a change from most other adventure games where it's usually my brain that gets destroyed. Watch out too for a wandering hermit called Herman who'll occasionally lend a helping hand if you get into a spot of bother.

Although *Funhouse* was written with *The Quill*, UDGs have been used to produce simple graphics and there's a rather natty semi-script redefined character set. If I have a gripe, it's more with the version of *The Quill* that was used than with the game itself. After a while the messages that appear between commands become very tedious — I don't want to keep reading 'I await your command' every other go. (I have enough of that at work every day!) The latest version of *The Quill* allows you to redefine all these messages.

Putting gripes aside, *Funhouse* is an excellent game and at this price it has to be a good buy.

ASHKERON
Mirrorsoft/£5.95

Up till now, Mirrorsoft has made quite a name for itself with its educational software. (*Troubleshootin' Pete's still trying to master the* Mister Men *game! Ed.*). But here's a new departure, an adventure game and a pretty good one at that.

You play Stephen the Blacksmith who's been chosen by his fellow villagers to go into the castle of the evil wizard. His task, once there, is to recover the five treasures that'll allow the wedding of the fair Princess Zeraphone to go ahead. For, according to local legend, the marriage will be cursed without them. They're obviously a jolly lot, the local folk.

The game makes a special feature of its 'walk-thru' graphics. And what are they, you ask? Well, basically they consist of a fairly normal



Disguise yourself as a pantomime cart-horse and you're away! At least the nose-bag will stop you chomping at the bit while you wait to get in!

screen picture covering part of the screen that scrolls in the direction you travel. The piccies are reasonable, if a little 'blocky'.

Watch out too for a couple of other unusual features of the game. There's a joystick option — for entering direction commands — and a randomising feature. Choose this and all the objects appear in different places in each game.

Ashkeron is well up to Mirrorsoft's usual standards and buried within it are some tricky problems waiting to be solved. So, if you're just hanging around street corners waiting to rescue another princess in distress, you'll be pleased to know this game gets my royal assent.

GIVE US A CLUE

You're in a right pickle. Visible exits are North, South, East and West. You go East. You're still in a right pickle. Visible exits are ... Well, now there's another way out — and we don't mean pulling the plug. You can write into Give Us A Clue and contact your fellow adventurers through the pages of *Your Spectrum*. Someone somewhere has solved your problem and is just dying to tell you how clever he/she is.

ADVENTURE AID

First, let's meet some of the brains so we can pick them! **Martin Mulrasey** has somehow found the time to complete *Lords of Time* and send in the following advice for the less fortunate. To get the keys in time 1, wave the lodestone and then in time 7, use your gauntlet to nab the falling star before trotting off to the spaceship.

James Elliot's sent in a long list of the adventures he's cracked, but we've only room for one clue. In *The Mountains of Ket* he recommends that you wave your wand and say 'Polo' to get round the wall — well, it is in mint condition! Hmmm, just hope that nobody can find holes in that. And well done James, 'cos your our Star Helper this month so watch out for the three pieces of software winging their way to you.

If *Snowball*'s the game that's currently driving you insane, here's a tip from **Harvey Lodder**. When you're in danger type 'P' and you'll find yourself in an asylum. To escape you'll have to type 'Pull Machine' and Enter, then retype 'Pull Machine'.

If none of these hints helps you, you'll just have to contact the ace adventurers listed below. Or failing that you'll have to admit defeat and fill in the coupon, won't you?

THE CHAMPION ADVENTURERS ...

Lords of Time
Martin Mulrasey, 234 Kerselbank Avenue, Grangemouth, Stirlingshire, Scotland FK3 0BS.

The Hobbit, Snowball, Inca Curse, Waxworks, Urban Upstart, Espionage Island, Planet of Death.
Harvey Lodder, 35 Shelley Avenue, Bullbrook, Bracknell, Berks. RG12 2RP.

The Hobbit, Urban Upstart, Quest for the Holy Grail.
Philip Kevin Bugler, 209 Trealaw Road, Rhonda, Mid-Glam., S. Wales. CF40 2NT.

Twin Kingdom Valley, The Hobbit, Lords of Midnight, Doomdark's Revenge, Urban Upstart, The Mountains of Ket.
James Elliot, 266 Caresview, Tullibody, Alloa. FK10 2SU.

Espionage Island
Mark Sayers, 38 The Drive, Amersham, Bucks. HP7 9AD.

THE LOST ONES ...

The Wrath of Magra "I can't get out of the valley (stage 1)." K.R. Hill, 1 Lake Cotts., Lake Lane, Barnham, W. Sussex. PO22 0AJ.

The Hobbit. "How do you kill the dragon?"
Richard Weeber, 20 Barry Close, Chadwell-St-Mary, Nr Grays, Essex. RM16 4SU.

Sherlock. "How do you stop Inspector Lestrade terminating the game when he arrests Major Ffoulkes?"
Hamptead. "What do I need, or where do I go for the cocktail party?"
Andrew Wesley, 61 Offchurch Road, Chubbington, Leamington Spa. Warwickshire CV32 7NG.

GO ON, GIS' A CLUE

OK, I give up/I'm the world greatest* on

....

Here's my problem/a whizzo clue*

....

....

....

....

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*Delete as applicable

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Fill in this form (or a photocopy), and send it to Give Us A Clue, *Your Spectrum*, 14 Rathbone Place, London W1P 1DE.

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JOYSTICK JURY

They came, they saw and they conked out — or rather the joysticks did. **Dave Nicholls, Roger Willis** *and* **Ross Holman** *hung on just long enough to give the verdict on all the new games.*

CHUCKIE EGG

A'n'F Software £7.95

Ross: Hen House Harry's back but he's no longer running round collecting seed while avoiding maniac hens. Harry's chucked up his rural roots to help out in a chocolate egg factory. The ladders and platforms have partly been replaced by ropes and travelators and there's not a caged bird in sight. Harry's task now is to collect all the goodies that go into making a choccy egg as well as the pieces of the toy to go inside it.

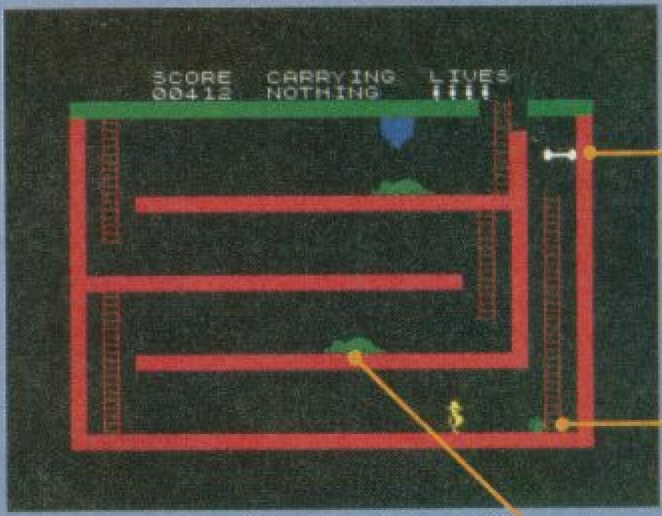
Harry can also pick up and drop many items that may help him on his way. For example, the first problem you come up against is an outsized pooch that's far from friendly. To get past him you have to collect a bone and then drop it at his feet. The dog then turns away, his tail wagging with pleasure and lets you pass. In the next 117 screens be prepared to meet all sorts of nasties and to face many more problems.

Harry runs around and bounces off walls in the same hectic way as he did in the original *Chuckie Egg*, but somehow the game lacks a certain appeal. To be fair to A'n'F they haven't tried to produce a clone of *CE1*. But by going for a game with 120 screens, each screen lacks a lot in the way of content.

You'll find your path is generally easy and very often there are no nasties to stand in your way. Still, it's enjoyable enough, though it may not appeal to the more sophisticated games player. **HIT**
3/5

Dave: Reasonable graphics, smooth movement, more platforms than Waterloo Station and about as addictive as British Rail coffee! **2/5** **HIT**

Roger: As platform stuff goes, this is bad enough to make a chap chuckie up. Never mind the 'henhouse', I'd put Harry in the doghouse... **MISS**
1½/5

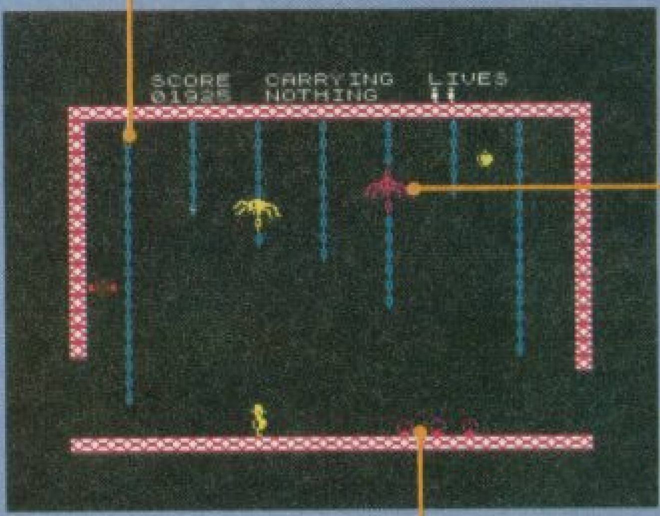


Here's your first challenge — to get past the pooch in the next screen you'll need the bone from this one. It's the only way you'll get a prolonged active life.

There are extra bonus points to be had if you collect objects like this apple but they serve no other useful purpose.

You've fed Fido and you've passsed the A'n'F chocolate factory, so now it's on to this screen. To get through you've got to jump from chain to chain avoiding the 'armful arachnids as you go.

Watch out for your first taste of the moving meanies. You'll soon suss out that the only way to get round them is to take a running jump and hope you don't come a cropper.



The spiders go up and down the chains just to make life difficult for you. And they don't even travel at the same speeds — the one on the right is faster than his mate on the left. If you fail to get past them, you'll just have to try and try again.

You can't jump over the three objects at the bottom of the screen. Well, who'd go across the top if you could?



GIVE MY REGARDS TO BROAD STREET

Argus Press Software £7.99

Ross: From the same stable as *Alien*, here's another film follow-up that's billed as a sophisticated adventure and strategy game. The plot pursues Paul McCartney's attempt to save his band and their music from the evil financier Rath *(any relation to Rath Bone? Ed)*.

You take Paul's part in his last ditch bid to track down the seven people involved in producing his latest album. They're the only ones who can help reconstruct the final missing track before midnight. Problem is that the magnificent seven are spread all over London. But to help you in your search, your in-car computer tracks their movements on the London tube system so you can predict where they're off to. If you're outside the tube station as they emerge then they'll hand over a snatch of the tune. Once all seven pieces are in the bag you can trundle off to Abbey Road for the remix.

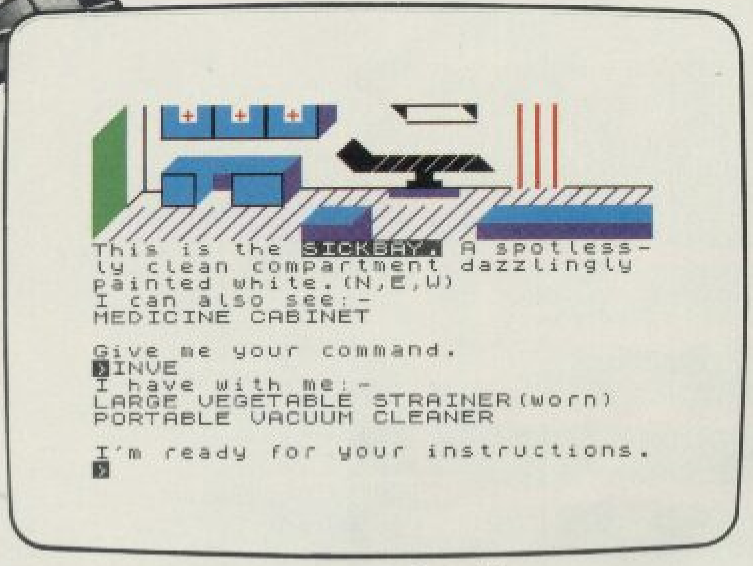
The game comes with a large scale map of London and a tube map. On the reverse you'll find full details on the people you're after. This'll help you plot their movements as the game progresses. The screen is split into 4 areas — a large section across the top of the screen shows your car *(is it a Beetle? Ed)* and a small area of London's streetplan. The other three sections give the gen on the missing people's movements and more detailed info on the locality.

It's an original idea for a game but it's pretty dull in the playing. It might offer a painless way for prospective cabbies to learn abut London — but if this is how pop stars spend their time I think I'll hang up my guitar. **2/5** **MISS**

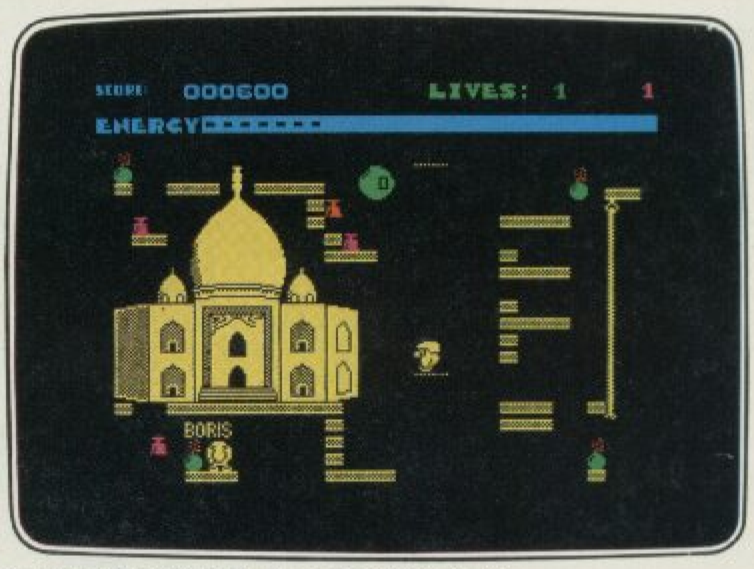
Roger: Another game-of-the-film-of-the-book-of-the-song that is best described as a spin-off that should, er spin off... **2/5** **MISS**

Dave: The map is quite big (and wrong in places!), and I found it rather more interesting than the game. If you like driving around in central London (do cab drivers read *YS*?), then you might enjoy it, otherwise give it a Broad (St.) berth. **2/5** **MISS**

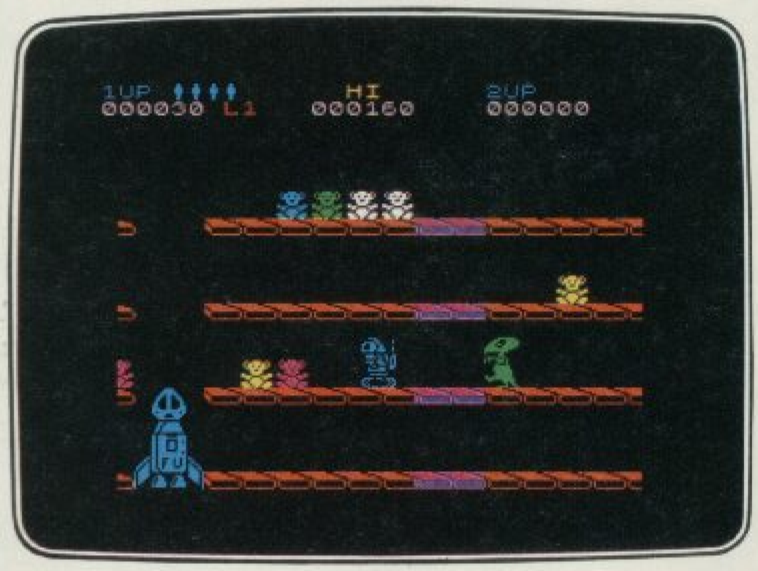
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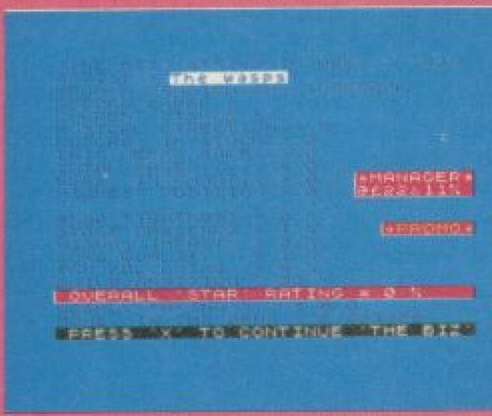
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THE BIZ

Virgin Games £6.95

Roger: Well, like, er, man, this is one tremendously bankable game even if it lacks stage presence in visual terms. Virgin has turned back to what it, like any record industry outfit made big, does best — explaining how the completely talentless can become international megastars.

The Biz is a perfect teaching aid for bongo thumpers on the make. It leads aspirants through the rock rat race, underlining how it's much more important to know the wheeling and dealing techniques than learning a few wretched riffs to strum. Just like in real life, you can forget the E sharp and F flats because the only important notes have pictures of the queen on 'em.

The cassette, besides carrying the necessary Spectrum-dedicated program, also has eight audio recordings including that well-known smash hit 'I'm in love with the girl on the Virgin Manchester Megastore checkout desk'... No, well I've never heard of it either, but there again I've never heard of you... If you get really good at the game, though, and become the first person to score a No. 1 hit, I might just start throwing knickers at you from the audience, along with millions of other screaming fans, because you'll actually be invited to record with Chris Sievey and The Freshies and appear live on stage. A Doo Wop, a loo bop a wham bam boom? **3/5** **HIT**

Dave: I'm about as musical as a prune so I thought I'd be quite good at this. Four singles and a year later I'd managed to get to number 120! Mind you, I did make a lot of money from live performances — perhaps the punters thought I was a comedy act! Horribly addictive and great fun — see you on The Tube. **4/5** **HIT**

Ross: If music be the way to earn a fortune, you can count me in. This really is the biz. **4/5** **HIT**

ARCHON

Ariolasoft £8.95

Ross: This is a strategy game that pits the forces of good against those of evil. You're greeted by the opposing forces lined up on either side of a board that chess players will no doubt recognise. At the start you're given the option of controlling the good guys or the bad guys, and whether to battle it out with the computer. You've got 18 pieces at your disposal and they can all move different distances though there are no restrictions on the direction.

But that's where the similarity with chess ends. In *Archon*, each character earns the right to take over an occupied square by beating the opposition in a bout of single-handed combat. There are many different forms of defence — some characters throw fireballs, some wield swords, while others generate a deadly force field. This mystic fisticuffs takes place on a separate screen with the characters' respective strengths shown by a bar at each side. Each time you're hit this strength reduces until one of the pieces is completely clobbered. Each side also has one magical being that can cast spells on the opposition. The ones to watch out for are the revive and heal spells that'll bring a defeated piece back to life or restore its strength.

To move the pieces, you must position a square on the chosen character's symbol and then press the key to pick it up. From there you can move it and drop it in the desired location. Although the board is chequered black and white, there are also some grey squares — the colour of the square a piece occupies will affect its fighting fortunes. The forces of darkness for example, do best on black squares. An added complication are the five power points positioned like a cross on the board. These squares have the power to restore strength and to protect from magic — occupy all five and you're automatically the winner.

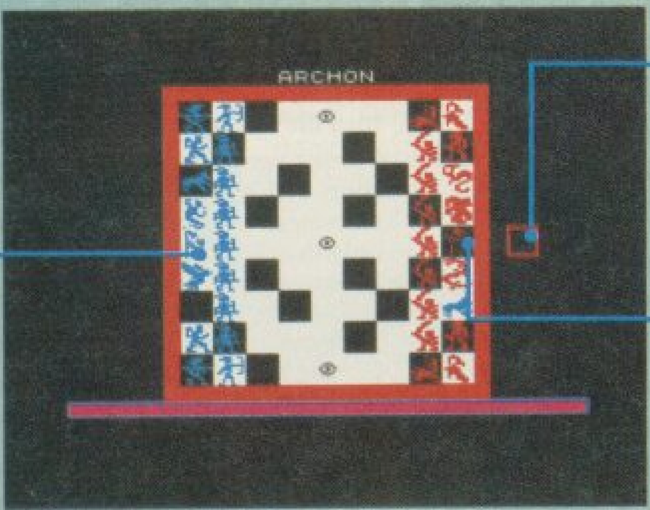
At first, *Archon* appears quite simple, but there's an underlying complexity to it that offers a formidable challenge. The combat screen is marred by jerky graphics and be warned, the computer's an annoyingly good shot. But then I always was a bad loser. **3/5** **HIT**

Roger: More of a boring game than board game, but both? **2/5** **MISS**

Dave: A strategy game and an arcade game in one package can't be bad *(who says? Ed)*. The computer plays a decent game, and I haven't yet come close to beating it. Still, it's got me hooked, so I'll crack on. **2½/5** **HIT**

Use the revive spell to bring back to life any of your lost characters — but make sure it's one of the strongest. There's no point in reviving a knight when you've got a wizard waiting in the wings.

Don't bottle out with your strongest characters — be brash with them to take out the lesser enemies with some swift moves from the back.



Use this box to indicate the character you want to move — and where you want to move him. Then tap the fire button and pow!

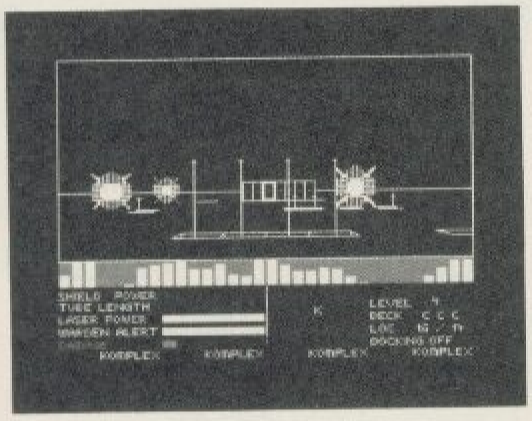
Try this for openers — before the opposition has time to rally, take out their main man. If you get the strongest character early on, it'll give you the edge.



A tip if you're playing the computer — move in close and then nip in and out of your opponent's firing line. That way you'll fool him into firing and you'll have as much time as it takes his missile to reach the other side of the screen to pump him full of lead. Go on, make my day punk!

On the combat screen get your chosen battle warrior body-poppin' — the more jerky his movements are, the less chance you have of being hit.

These objects just get in the way but if you use them to good effect you can use them as defence shields.



KOMPLEX

Legend £9.95

Roger: Komplex is just what it says — complex. Apparently, you can create seventy thousand million different maps if so inclined but player-generated maps, just like the standard K.O.M.P.L.E.X. one, all have seven deck levels of a diamond shape. Changing the map is just like changing one's underpants — you don't notice after you've put your trousers back on. That, pretty much, *(not that there's anything pretty about Willis's underwear. Ed)* sums up the game. Despite excellent scrolling 3-D action, a high yawn factor is guaranteed by crushingly similar — and uninteresting geography.

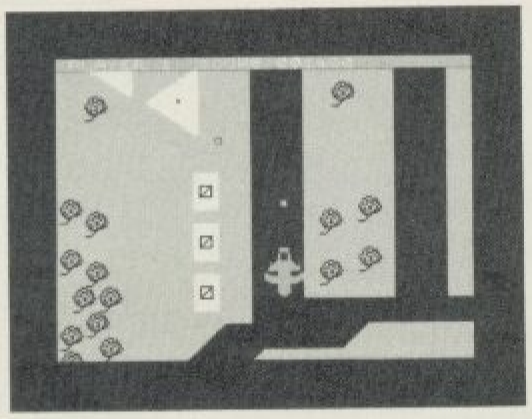
But that's not all, because location komplexity (groan) can be safely ignored. The less-cerebral amongst us just zap about blasting the monitors and wardens with lasers and collecting and dropping Target Modules in the appropriate place. Fallen safely to sleep yet? Yes, Komplex isn't really complex (double groan) at all because it's just another old dose of shootiebangs in space clothes.

Komplaining without kompassion about the kontent without kongratulating *(kut it out! Ed)*, the programmer on graphical action excellence may seem unfair, but computer games are supposed to be fun, not works of art, and this ain't. Just like the last offering, *The Great Space Race*, it's better than Valium. **MISS**

2/5

Dave: Will Legend ever release a good game? This one's just as boring as *TGSR* though the graphics are a bit better. Basically a komplete waste of time and money. **0/5** **MISS**

Ross: Is it me? I couldn't make head or tail of this and when I did I realised it was a waste of time. Nope, it was them! **1/5** **MISS**



FLAK

Funsoft £7.95

Dave: Right from the start the signs aren't at all promising. There on the inlay card is a screen shot from the Commie 64 version. When you've loaded up you can see why they decided against printing a Speccy shot. There you are, a badly drawn sprite with an attribute problem flickering across a charmless landscape made up of character squares. Now that's not really a big enough inducement to put on the cover to persuade me to part with the readies.

The game's really just a rip-off of the arcade classic Xevious that offers a trip out in an 'advanced AGX hypersonic fighter' — that's the flickering sprite. Occasionally another sprite flickers up to you and that usually triggers off a dull looking cyan explosion. The screen scrolls more slowly than a C5 at top speed and your hypersonic wotsit flies at such a snail's pace that it's impossible to dodge the barrage of missiles blasted at you. Consequently, each game lasts about 10 seconds and can only be stretched out should you really want to, by using the one obvious bug — keep your finger on the fire button at take-off and you're invincible for a few seconds.

All in all, one that should've been drowned at birth. **0/5** **MISS**

Roger: The player may hope to 'take over the universe' but this game won't. **1½/5** **MISS**

Ross: How could they do this to one of my fave arcade games? The 'awe-inspiring' scenery only inspired me to turn the Speccy off. **1/5** **MISS**

JONAH BARRINGTON'S SQUASH

New Generation £7.95

Roger: I'd always thought that squash was a silly game played by overweight and middle-aged executive types to burn off the worst effects of their business lunches. The obvious reason for playing it inside a big indoor 'box' is to stop the rest of us from seeing them at it and cracking up in helpless mirth... That's still probably a fairly accurate description of the real thing but the Speccy version is something else.

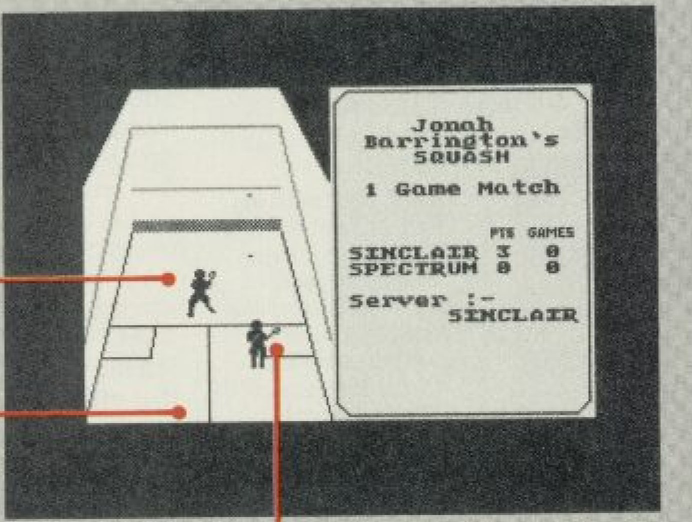
It features all the basic elements of the sport with two players on court, one of whom can be computer controlled. The only thankful absence is the wobbling bellies and puffing and panting.

The graphics and ball movement are realistic but the computer chooses stroke for you if the player has been positioned with some reasonable degree of accuracy. There are four options of difficulty and I can say, from experience, that it's easily possible to beat the Spectrum at the easier levels. Squash is a well-crafted chunk of sporting software which, usually, isn't boring to non-enthusiasts of the aforesaid physical pursuit.

It won't cut down on the jolly old midriff bulge, but then nobody will laugh at you either. **4/5** **HIT**

Dave: It felt a bit strange playing squash and not ending up drenched in sweat and gasping for air. Still, the graphics are good and the game's addictive. I also found out that Jonah Barrington is mike shy — the voice synthesis sounds like he spent hours down the pub getting his courage up... **3/5** **HIT**

Ross: Master the techniques necessary for hitting the ball against the wall and you'll find this an enjoyable game. The lack of diagonal movement though is a pain, but not as much of a pain as playing the real thing. It's a pity that Jonah Barrington sounds like he's got a squash ball in his throat. **3½/5** **HIT**



To put some spin on your serve, try pushing the joystick forward as you press fire. It's not in the instructions but it seems to work for us!

As soon as you've returned a serve, leg it to the front of the court. That way you're in charge of the action.

While your opponent's serving, you'd be well advised to take up a position at the back of the court. Nine out of ten times this is where the ball ends up.

You can choose any one of six different angles to hit the ball by holding down the fire button for different lengths of time. Phew this is nearly as tiring as the real thing!

The computer automatically moves your racquet from one side to the other to strike the ball. Make sure you press the fire button only when you're on the side you want to play from.

Pick of the week

POPULAR Computing WEEKLY

Legend is the only company I can think of at the moment that manages to be both famous and infamous at the same time. I would describe the credibility history of the company roughly like this: *Valhalla*, two steps forward, *The Great Space Race*, two steps back. Now we have *Komplex* and I'm pleased to say it's at least $1\frac{1}{2}$ steps forward again.

Komplex is not, in any significant way, an adventure – it looks vaguely like *3D Battlezone* but it's better than that. Call it an abstract arcade game that could last for a couple of hours in play.

It works like this: two thirds of the screen displays a three dimensional view of the decks and levels of an alien world. In this world are scattered letters of the title K,O,M,P,L,E,X. You must locate each letter and place it in the central control computer.

Moving from level to level takes place via a tube which is protected by various devices. Other devices on each deck drain power from you.

You could say *Komplex* is a 3D collect and dodge type of game but that's to denigrate it. The strategy elements of the game are fairly sophisticated and you don't just blast and blast – there is no question of three lives here.

But the most impressive thing for me is the look of the game. The landscape where all this action takes place is genuinely strange and alien. What you see, as you move around this world (in excellent hi-res scrolling perspective), are rectangles in the middle of nowhere, curious spindly poles, sudden holes in the ground, dream-like floating geometrical aliens and the fact that it's all in black and white just adds to the faintly mathematical and disturbing effect.

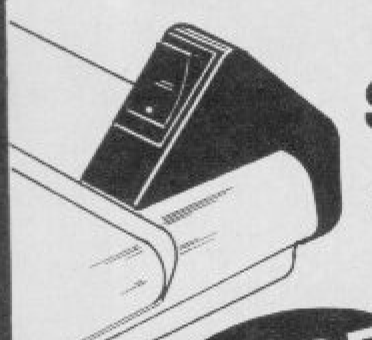
Komplex is a truly imagination gripping game, something that cannot be said for many others. You'll need to map its world if you're going to stand any chance of locating the letters and finding your way through the service tubes to the CCC. It's mostly brains, not brawn, that's required.

KOMPLEX

LEGEND

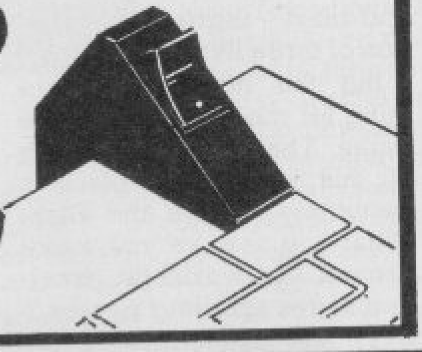
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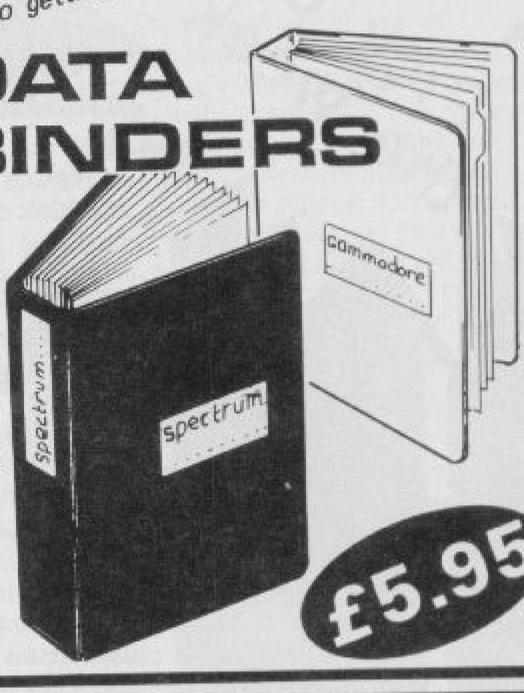
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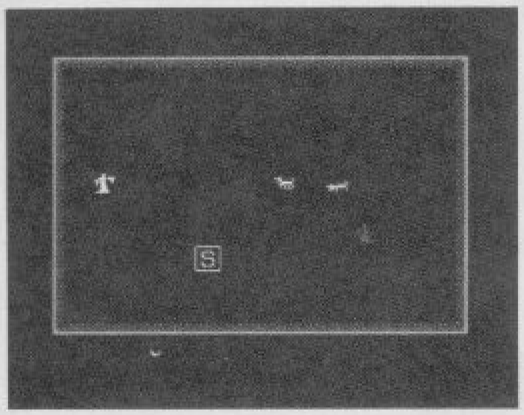
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CHAOS
Games Workshop £7.95

Dave: This one's subtitled 'Magic and Death on the Plane of Limbo' which makes it sound like an occult version of Airplane II. In fact, it's another magical mystery tour-type strategy game that's enlivened by some creative touches of animation.

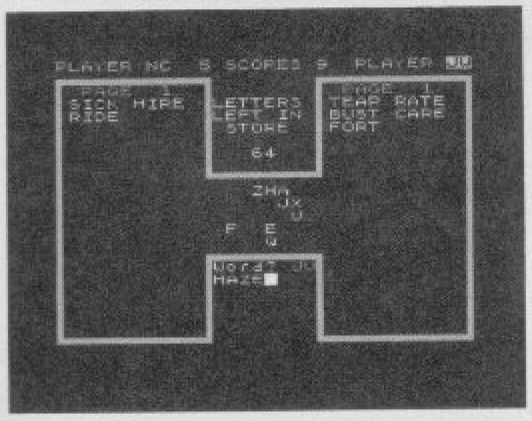
At the off, you can choose up to eight different wizards any or all of whom can come under the control of the computer. If you're feeling really limbo-like, it's a wheeze to set them all off and sit back to watch them slug it out. There's also a random hand-out of spells that allow you to summon monsters and call up a plethora of peculiar weapons. Luckily, they're all spelled out in the manual.

There are eight different difficulty levels for you to choose so it'll take more than a morning to master. And the game's fast enough to provide a satisfying slugfest for all but the most hardened arcader, plus the animated graphics make it constantly entertaining to watch — well, what d'you think a Gooey Blob looks like?

Chaos offers enough magical unpleasantness to keep swords and sorcery fans in a teeth gnashing frenzy — just what the dentist ordered. So grab your box of magic tricks and do it to them before they do it to you ... **HIT**
4/5

Roger: The Concise Oxford Dictionary gives a variety of meanings to this game title, many of which are applicable to content. **2/5** **MISS**

Ross: It takes a while to get into the swing of this game but once you've sussed the sorcery, it'll have you under its spell. **3/5** **HIT**



SNAFFLE
Longman £9.95

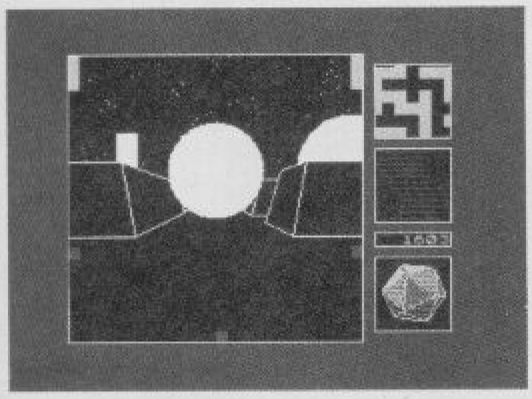
Dave: Here's a word game that bears a remarkable resemblance to another word game called Sc.....well, let's just say that any resemblance between the two is probably purely intentional. This one's described as a fast and furious game for all the family. Mmmm. Fast, maybe but furious, almost certainly — one of those games that's likely to have everyone from 8 to 80 arguing like good'uns.

Certainly, the booklet that comes with it isn't bad so what about the game? Well, on loading you're first asked how many players there are. At the last count there was only one of me, so I shall invent a chum called Bob. In go our initials and away we go. I press a key until a letter appears. Bob presses one, another letter. And so it goes on until one of us spots a word. We then use the Pick key to regroup the letters and the word's made. I'm then asked if I agree that Bob's word 'Blitnung' is valid. If Bob's happy with it, so am I!

The booklet suggests that we keep a dictionary handy. I agree. Word games on the computer will always seem a bit pointless until they have a dictionary built in. This game should aid the decline of literacy no end. **2/5** **MISS**

Roger: There's a word to describe this game but the Ed would only cross it. Suffice it to say I wasn't impressed. **1/5** **MISS**

Ross: There's no reason to put this on computer at all. In fact, there's no reason for the game at all. Bored then snored! **1/5** **MISS**



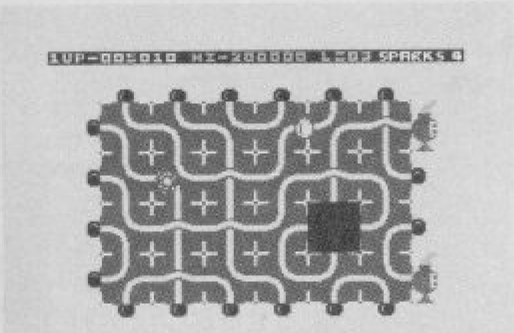
GYRON
Firebird £9.95

Roger: Any lump of software that gets nominated as a legend in its own lunchtime, is in serious danger of a generally rocky ride. Well, *Gyron* cannot escape completely. The ten battalions of mathematical geniuses who took about seven trillion light years to carve the game out of living machine code have created some stunning visual effects but they haven't come up with the game content.

Gyron is best described as a 3D maze of considerable complexity. The quality of the graphics is certainly exceptional as you trundle through the corridors of alien power pursued by giant spheres. But this is no variety act. It could take another trillion years to suss out the maze exits and the scenery will still stay the same. A small hint that some smart marketing kiddie has sussed the problem comes with *Gyron*'s attachment to a spiffing competition — the winner gets a Porsche 924 just like the ones we had on *YS* before we got our Rollers. Pass me the joystick and, er, wish me luck! **MISS**
2½/5

Ross: This is impressive — until you start playing. Then it's just a question of slowly trundling round a 3D maze trying to justify forking out a tenner on this tedium. **2/5** **MISS**

Dave: Firebird says that the changing elements of the maze repeat every 100,000 years — that means they'll be coming round again just about the time I next load the game up. **HIT**
1/5



CONFUZION
Incentive Software £6.95

Ross: Haven't we been here before? This puzzle-type game's very similar to *Zenji* by Activision and will appeal to much the same people. The game's built up of fuses, bombs and sparks and the idea is simply to arrange the fuses so that they lead the sparks to the bombs. Explosive stuff, eh? Well, not quite. The fuses are split into curved sections so they can be rotated through 90 degrees and joined in a multitude of ways. To make life trickier you've only a limited time to complete each grid.

The number of bombs you have to blow up and the complexity of their fuses range from the 'possible to the close your eyes and hope for the best'. The controls are a synch and you can use the joystick to highlight a large portion of the fuse-ways — the fire button then rotates that bit.

The difficulties begin when you attempt to usefully direct the constantly moving spark. By luck rather than judgement, I managed to clear a few screens. Nevertheless, you will develop a feel for the game and I don't doubt that with some thought you could work out a perfect system. The graphics and sound are reasonable so if you fancy blowing cobwebs from some of those dormant brain cells check it out. But don't expect the big bang. **2/5** **HIT**

Roger: Read the name and then agree that yes it is, isn't it! **2/5** **MISS**

Dave: I do have rather a soft spot for puzzles and this one isn't at all bad. It'd be nice if you could slow it down a touch though — my brain just can't keep up — and I don't want any sarky Ed's comments. *(As if! Ed).* **3/5** **MISS**

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ARNHEM
CCS £7.95

Dave: At last — a wargame that's both playable and makes full use of the Speccy's graphics. If I've been hard on this type of game in the past it's because none I've seen has yet come up to this standard.

First off, you're given the choice of four basic scenarios. If you're new to the game it's an idea to go for the easy option, a seven turn reccy round the battlefield. The next three cover specific operations that take more time but should turn you into a battle scarred veteran. Only when you've got ten hours to spare is there any point in tackling the final scenario that covers the complete Market Garden area. At the beginning it's sure to be a whole river full of bridges too far.

If you're on your tod, you'll control all the allied forces while the computer plays the Germans — with a friend, the allies split into Brits and Yanks and there's even a three player mode that offers a complete free choice.

Play is certainly fast but it's easy to follow so you shouldn't get hopelessly lost just as you thought you'd got 'em outflanked. Plus there are sound effects and on-screen flashes that show when a unit is under attack.

The scrolling screen covers the whole of the Arnhem area and there's also an accompanying map and booklet for budding battlers. In-door generals who'd probably find the real thing a touch too noisy could do worse than take a look. **4/5** **MISS**

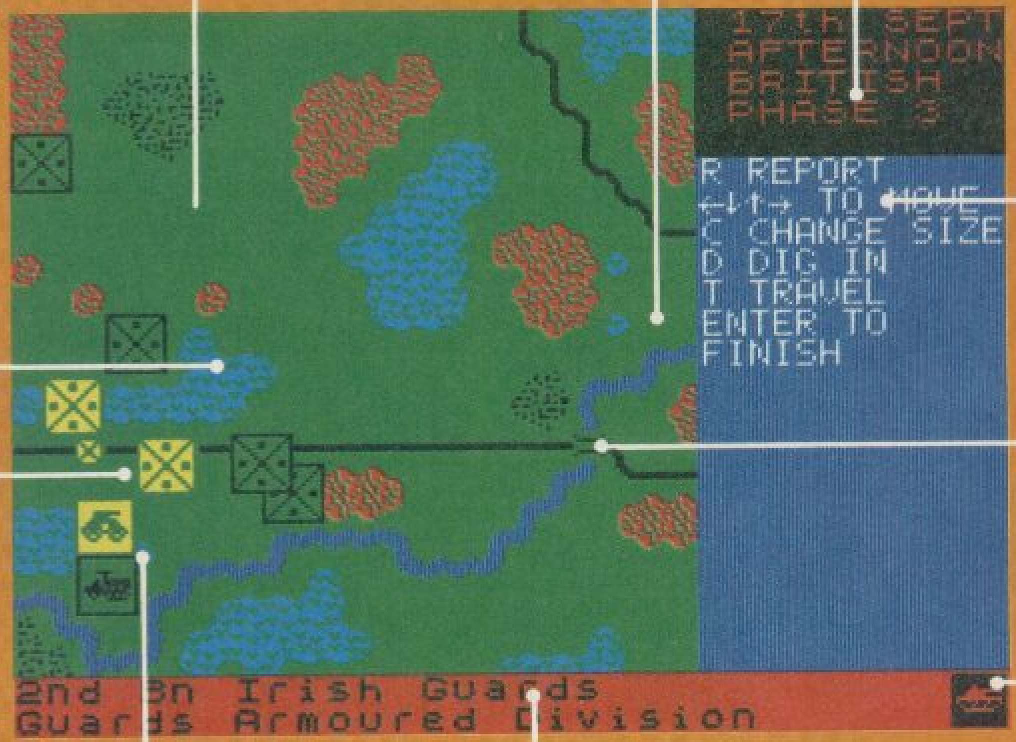
Roger: Outside my usually cowardly tastes but good enough to make me take a general's job — leading from the rear ...**4/5** **HIT**

Ross: Not my sort of software but I soldiered on — and then got beat! **3/5** **HIT**

The Advance to Eindhoven is on. This is the easiest of the five different scenarios and it'll only take you seven turns. The objective is to clear the centre road of German units. Course, if you're really a military megabrain you could change the course of history, beat the Germans and star in a remake of the film epic.

Here's an overview of your immediate terrain. It probably covers somewhere in the region of a fourteenth of the total battlefield.

More info on what stage of the game you're at — on the easiest level there are seven phases building up to twenty-six on the trickiest. The border colour even changes to let you know when a different player's turn's come.



Keep off the grass! It's a lot trickier trudging over the rough terrain than going by road, so travel by tarmac if you've got to be there yesterday. But remember — you're a lot more vulnerable to enemy action when you're in the open.

All the computer's despatches are posted here. You could almost class *Arnhem* as a menu-driven wargame.

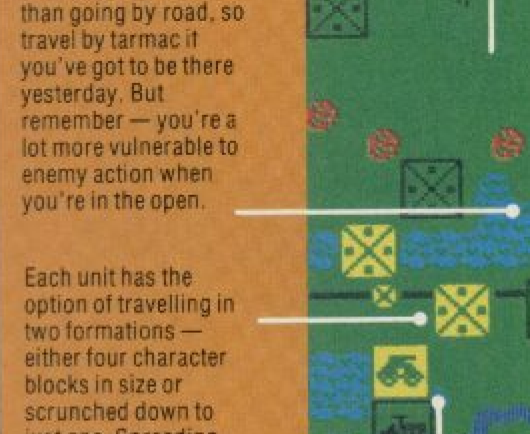
Each unit has the option of travelling in two formations — either four character blocks in size or scrunched down to just one. Spreading out means you can go on the attack and your troops are less vulnerable. In the tight formation you can squeeze through smaller gaps, march along the roads at double quick time but if you're clobbered your troops'll sustain twice the damage.

If the bridge is too far you'll find that the enemy has moved in pronto to guard it. Once they've put troops on bridge patrol, you'll find it pretty tricky to shift 'em.

The symbol here shows the type of unit you're moving. The 2nd Bn. Irish Guards is all tanked up and ready to roll ...

There's a right barney going on here. To engage in battle with the enemy choose the bombard option from the menu, position the cursor and you'll be taken straight into the thick of the battle. The on-screen icons'll let you know the fire power of the opposing units.

Here's the roll-call of your troops. If you're yomping your way through one of the trickier scenarios, one or more of your units may be off-screen. When their turn comes round the screen scrolls to that territory.



ICICLE WORKS
Centresoft £6.95

Roger: Have we been here before or what? Turning down the temperature on stuff like *Boulderdash* doesn't improve a tired scenario.

All that's demanded of the undemanding is to scuttle about collecting stuff, tunnelling through poorly defined and barely visible snow-like substances and avoiding the dislodged balls that might fall on one's little frosty head. Jerky scrolling moves the action across the screen and the clock runs out even faster than my short-fuse patience. The thirteen ice-cold rooms offer as much fun as a fortnight in a fridge-freezer though the fauna is more fearsome — polar bears and killer penguins.

Having seen this type of software product climb up into precision platform pleasure, all I can dumbly consider is that *Icicle Works* has stepped through a time warp, missing all the clever programming trickery of the last year or so. *Icicle Works?* No it doesn't. **1/5** **MISS**

Dave: I've been waiting for a good Digdug/Mr Do game to come out on the Speccy and after seeing this, I reckon I'll just have to wait a bit longer. It's a good idea but the implementation lets it down. When was the last time you saw sprites moving two cursor blocks at a time? **2/5** **MISS**

Ross: There's nothing original here and, yes the graphics are jerky and sometimes obscure but it still got me hooked. If you haven't seen its predecessors take a look. **3½/5** **MISS**

FLASH MOVES

Flash, bang, wallop, what a picture! 20th Century* Chris Somerville *takes a look at loading screens and shows you how to turn them into moving pictures.

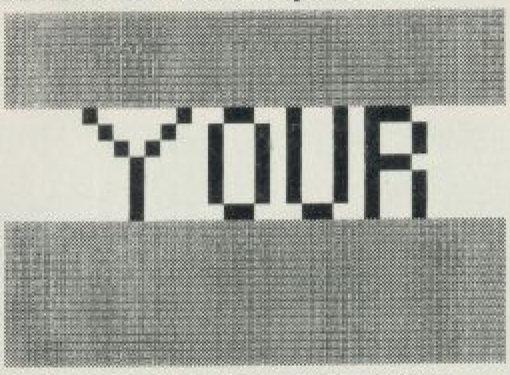
A title page is a great way of adding that extra professional touch to your programs. Use SCREEN$ to save it and it'll load before the main program. That way you'll keep up flagging interest during those long LOADs and raise expectations for the program ahead. The big snag (*I knew it — there's always a snag! Ed*) is that it adds considerably to the loading time — a standard loading screen takes up 6.75K of memory.

Now, it's possible to design a much simplified title screen using only the 768 bytes of the Attribute File. You'll find this reduces the loading time from around forty-five seconds down to about five. And it's here that you get the added bonus — animation throughout the loading. You can flash words on the screen just like in *Manic Miner* — take a look at the demo program to see how it's done. Or you could extend the process to cover anything that moves. How about a ghost that appears and disappears, a see-saw rising and falling or Troubleshootin' Pete getting in'n'out of his comfy chair!

NAME DROPPING

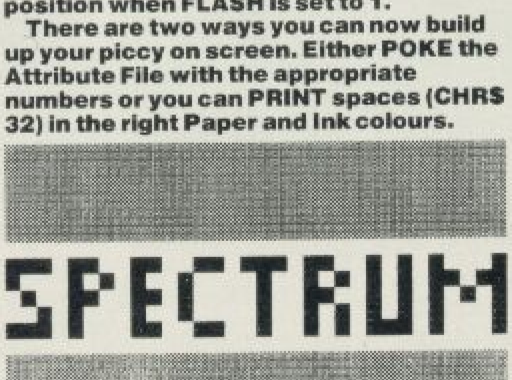
Our name in lights at last! Pretty flash, eh? These two piccies show you exactly what you'll get by typing in the listing below.

When you're designing your own screens always think in terms of two different screens. Draw the first one on squared paper — graph paper's a good idea — showing all the colours. Remember these are Paper colours.



Next, design the screen for stage two, this time on squared tracing paper, making sure the squares match up with those on screen one. Then indicate each colour with its initial or code number — these are all Ink colours. Now, lay the tracing paper over the graph paper and you should see just what Paper and Ink colour you need at every character position when FLASH is set to 1.

There are two ways you can now build up your piccy on screen. Either POKE the Attribute File with the appropriate numbers or you can PRINT spaces (CHR$ 32) in the right Paper and Ink colours.



This demo program POKEs all the data into the Attribute area of memory. Every time you enter 191, for example, you're supplying info about one character square that has FLASH set to 1, PAPER white and INK white (128+56+7). As the Paper and Ink colours are the same there'll be no movement or colour change to these areas of the screen.

```
10 REM DEMONSTARTION LOADING
          SCREEN
20 REM
     RUN THIS PROGRAM THEN
     SAVE THE RESULTING
     SCREEN BY:
   SAVE "ys"CODE 22528,768
25
26
```

Lines 10-26 REMark statements for your info

```
100 DATA 9,191,191,191,191,191,
151,191,191,191,191,191,151
105
110 DATA 191,191,151,151,191,19
1,151,191,191,151,191,151,151
115
120 DATA 151,191,191,191,191,19
1.191,186,186,186,191,186,186
125
130 DATA 151,191,186,186,151,19
1,186,146,191,186,146,186,151
135
140 DATA 186,186,151,191,146,19
1,186,151,186,191,191,191,186
145
150 DATA 186,191,191,191,186,19
1,186,151,186,151,191,186,191
155
160 DATA 151,191,191,146,191,15
1,186,191,146,191,146,191,186
165
170 DATA 151,186,186,191,186,18
6.191,186,191,191,186,186,191
175
180 DATA 191,146,186,191,186,19
1,151,191,191,146,191,151,186
185
190 DATA 186,151,191,146,151,14
6,191,186,191,186,191,186,191
195
200 DATA 191,186,191,186,191,19
1,191,146,191,191,186,191,151
205
210 DATA 191,191,146,191,151,18
6,191,146,191,146,191,186,151
215
220 DATA 186,191,191,191,186,18
6,186,186,191,186,191,191,191
225
230 DATA 146,186,191,191,186,14
6,191,191,146,191,151,186,191
235
240 DATA 146,191,146,186,186,15
1,186,191,191,191,186,191,191
245
250 DATA 191,191,191,191,191,19
1,151,191,191,191,191,191,151
255
260 DATA 151,191,191,191,151,15
1,191,191,151,191,191,151,191
265
270 DATA 191,191,191,191,9
275
280
```

Lines 100-280 The data statements with all the info to be POKEd into the Attribute area

```
1000 CLS : RESTORE
1010 READ a
1020 FOR i=22528 TO 22687: POKE
i,a: NEXT i
1030 FOR i=22688 TO 22911: READ
a: POKE i,a: NEXT i
1040 READ a: FOR i=22912 TO 2329
5: POKE i,a: NEXT i
1050 STOP
```

Lines 1000-1500 This part of the program POKEs the data into the attribute area.

```
9999 PAUSE 300: INK 7: CLS : LIS
T
```

Line 9999 This line halts the program for a few seconds, then lists it.

MOVING PICTURE PAINTER

Here's the easy way to create your animated loading screens — an on-screen editor that lets you create two independent attribute pictures before mixing them together.

```
  10 REM TWIN SCREEN PAINTPAD
  20 CLS : PRINT "Build your fir
st Screen by        using the CURS
OR KEYS (5 to 8). You can change
 COLOUR at any      time by pressi
ng C and entering a colour numbe
r (0 to 7).         Press F when F
INISHED."
```

Lines 10-20 Here are the (brief) instructions — practice'll show you just what you can and can't create.

```
  30 RESTORE : FOR i=USR "a" TO
USR "a"+7: READ x: POKE i,x: NEX
T i
  40 DATA 170,85,170,85,170,85,1
70,85
  50 PRINT '"Press a letter to s
tart"
  60 PAUSE 0
  70 FOR j=1 TO 2
  80 PAPER 7: INK 0: CLS
  90 FOR k=0 TO 20 STEP 2: FOR l
=0 TO 31 STEP 2: PRINT AT k,l; I
NK 0;CHR$ 143;CHR$ 144;AT k+1,l;
CHR$ 144;CHR$ 143: NEXT l: NEXT
k
 100 LET x=0: LET y=0: LET o=0:
LET p=0
 110 PRINT# 1;"CURSOR COLOUR =";
p
```

Lines 30-110 Set up the initial routines. Lines 30 and 40, for example, set up a UDG character for the checkerboard screen pattern that'll help when you're working from squared paper.

```
 120 PRINT  FLASH 1; OVER o; INK
 p;AT y,x;CHR$ 143
 130 LET i$=INKEY$: IF i$="" THE
N  GO TO 130
 140 IF CODE i$<53 OR CODE i$>56
 AND i$<>"c" AND i$<>"f" THEN  G
O TO 130
 150 IF i$="c" THEN  INPUT "Colo
ur ? ";p$: IF CODE p$<48 OR CODE
 p$>56 OR LEN p$>1 THEN  GO TO 1
50
 160 IF i$="c" THEN  LET p=VAL p
$: PRINT#1;"CURSOR COLOUR = ";p
 170 IF i$="5" THEN  PRINT AT y,
x; OVER o; INK p;CHR$ 143: LET x
=x-1: IF x<=-1 THEN  LET x=31: L
ET y=y+(1 AND y<21)-(y AND y>=21
)
 180 IF i$="f" THEN  PRINT AT y,
x; FLASH 0; INK p;CHR$ 143: GO T
O 240
 190 IF i$="8" THEN  PRINT AT y,
x; OVER o; INK p;CHR$ 143: LET x
=x+1: IF x>=32 THEN  LET x=0: LE
T y=y+(1 AND y<21)-(y AND y>=21)
 200 IF i$="6" THEN  PRINT AT y,
x; OVER o; INK p;CHR$ 143: LET y
=y+1 AND y<21
 210 IF i$="7" THEN  PRINT AT y,
x; OVER o; INK 0+(p AND o=0)+((A
TTR (y,x))-56 AND o=1);CHR$ 143:
 LET y=y-1 AND y>0
 220 PRINT AT y,x; FLASH 1; OVER
 o; INK p;CHR$ 143
 230 PAUSE 20: GO TO 130
```

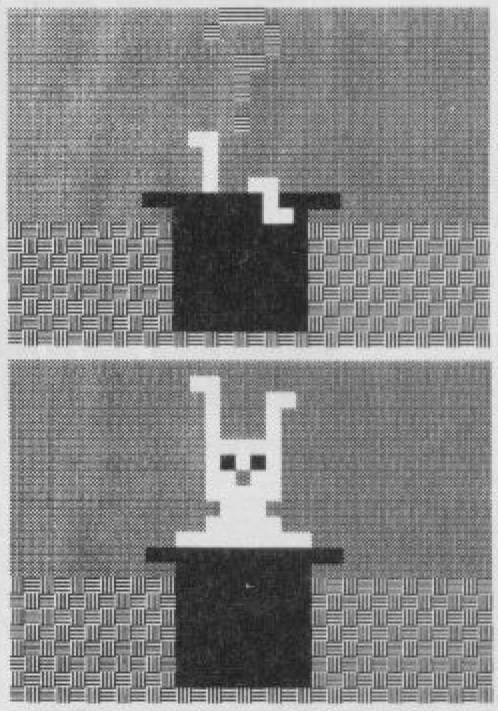
Lines 120-230 This is the main loop of the program.

```
 240 IF j=2 THEN  GO TO 310
 250 INPUT "": PRINT# 1;"PLEASE
WAIT A MOMENT"
 260 DIM a(704): FOR i=22528 TO
22528+703: LET x=PEEK i: LET x=(
x-56)*8: LET a(i-22527)=x
 270 NEXT i
 280 CLS : PRINT AT 10,1;"PRESS
ANY LETTER TO BUILD YOUR
 SECOND SCREEN"
 290 PAUSE 0
```

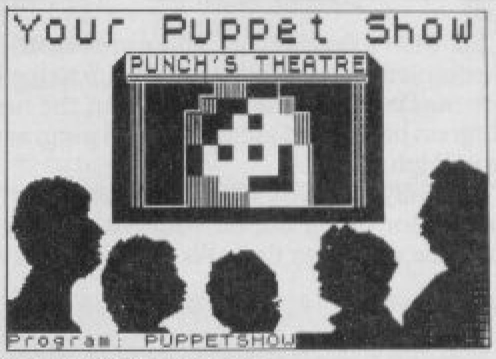
Lines 240-290 This part of the program stores the first screen ready for you to start on the second.

```
 300 NEXT j
 310 FOR i=1 TO 704: LET x=PEEK
(i+22527): LET x=x-56: LET x=x+a
(i): LET x=x+128: POKE (i+22527)
,x: NEXT i
 320 INPUT "": PRINT# 1;"Press S
 to SAVE your picture"
 330 IF INKEY$<>"" THEN  GO TO 3
30
 340 LET i$=INKEY$: IF i$="" THE
N  GO TO 340
 350 IF i$<>"s" THEN  STOP
 360 INPUT "ENTER PICTURE TITLE"
;p$
 370 SAVE p$CODE 22528,704
 380 STOP
```

Lines 300-380 The final part of the program mixes the two screens and then saves your creation to tape.



HAT TRICK
See just what you can do with a picture constructed entirely of squares. If you prefer you can use a commercial graphics program — *Melbourne Draw*'s the one to go for as you can easily set and change the Attributes. Watch out though, 'cos these programs SAVE both the Display and Attribute Files. You'll have to make some slight changes to the program or else LOAD back the SAVEd piccy and then SAVE it a second time with only the Atrribute File.



NOW YOU SEE IT ...
Of course, you don't have to go the whole hog and animate all the screen. You can always move just a small area within a larger static picture that can be drawn to pixel definition. Turn FLASH on for your chosen section and off for the rest of the screen. The problem is that you'll have to use SCREEN$ for saving and loading, so you'll lose the advantage of a fast load.

NAILING THE FILES

So, how's it done? First off, let's have a look at the two areas of the Spectrum's memory that cover screen pictures, the Display and Attribute files. The first covers shapes, such as lines, circles and so on, whilst the second's concerned with the quality of those shapes, their colour, brightness and whether or not they're flashing. If you're into the technical details, the Display File starts at address 16384 and ends at 22527, that's 6143 bytes and the Attribute File runs from 22528 to 23295, or 768 bytes.

Now, the reason that the Display File's so much longer is because a shape can be drawn to pixel definition but when you assign attributes you can only do it for blocks of eight by eight pixels. Say you were to design a picture that didn't use shapes, only squares of colour. Then you wouldn't need to save the Display File or any of its 6143 bytes at all.

The Attribute File holds its info in a pretty straight-forward way, as it follows the normal PRINT AT position of the screen. So, the file's first address (22528) is equivalent to the first PRINT position on screen (Line 0, Column 0), the second address (22529) to the next PRINT position (Line 0, Column 1) and so on. You can POKE into the Attribute File with the Ink colour number plus eight times the Paper colour number. Then add 128 to this number if you want the square to flash or for a bright square add 64. To give it a go, try:

```
POKE 22592,186: REM (7*8)+2+128
```

That'll give exactly the same results as:

```
PRINT PAPER 7; INK 2; FLASH 1; AT 2,0;
CHR$ 32
```

In both cases you'll get a red and white flashing square to the left of the screen three lines down.

Of course, you can also use the ATTR function to discover the Attributes at any character position. You'll see that PRINT ATTR (2,0) gives the same result as PRINT PEEK 22592. You can save the screens you've created in this way, not by SCREEN$, but by:

```
SAVE "picture" CODE 22528, 32*22: REM 32
columns, 22 lines
```

then load it back with:

```
LOAD ""CODE, 22528
```

In just five seconds your title screen will have loaded.

ON THE MOVE

From here, you can start adding animation. It's a doddle to do and the devil to describe. It all hangs on the way FLASH operates. When FLASH is on, each of the character squares alternates between the Paper colour and Ink colour of that square. So, if you design using, say, red Paper with yellow Ink and keep the surrounding area set to yellow paper with yellow Ink, then your picture alternately appears and disappears. That's because the effects of FLASH become invisible as soon as you have the same Ink and Paper colours.

It's not far from making a design appear and disappear to changing from one design to another. And that's the basis of all animation. Walt Disney eat your heart out!

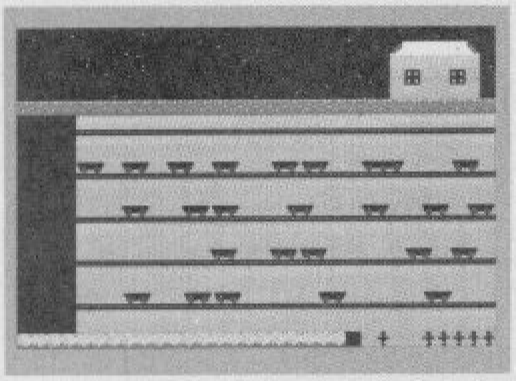
PROGRAM POWER

***Here's some Manic Mimicry of the YS kind plus a double-sized helping of troubleshootin' utilities. All with the compliments of* Peter Featherstone, Kevin Swift *and* Freddie Lewis. *Send your contribution to* Gavin Monk, Program Power, *Your Spectrum*, 14 Rathbone Place, London W1P 1DE.**

MINER MANIA

FREDDIE LEWIS

This program's on Digi'T'ape – see page 57



Liven up life deep down in t'pit lad! Shine-up thy boots, polish they pick and get diggin' this mine-boggling program.

Go on, dig deep and discover a game that no-one's gonna call the pits. Mining games have become a mania recently so not to be outdone by pale imitations like *Monty Mole* and *JSW*, *Your Spectrum* proudly presents the definitive version. And don't be put off 'cos its written in Basic — *Miner Mania* makes full use of pixel movement, character animation and machine code sound. And to top it all, it's fast!

So, what's the pit plot? There are seven levels of play that you've to complete by working your way up to the house at the top of each screen. The screens become harder, the further into the game you progress but a good arcade ace will jump at the challenge of upping those high scores.

The only keys you'll have to master are 'Z' for left, 'X' for right and 'P' for jump. So, on with the helmet, light up the lamp and you'll be off down t'pit. As the man said, what's mine's, yours.

```
2 GO SUB 9000
3 LET HI=1000
4 POKE 23296,CODE "+"
```

Lines 1-4 Set the machine and user-defined graphics. Intialise the high score and enable the scrolling.

```
10 POKE 23301,120: POKE 23305,0
11 LET DE=0
12 POKE 23296,148
```

Lines 10-12 Set up the machine code sound parameters.

```
30 BORDER 1: POKE 23693,32: CLS
40 FOR N=0 TO 5: PRINT  PAPER 6,,: NEX
T N
60 PRINT AT 1,6; PAPER 6;"■■■■■■■■■■■■■■■
■■■■■■■                ■■■■■■■■■■
■■                 ■■■■■■■■■■■■■■■■■
"
65 PRINT AT 18,1;"11 STAGES OF IMPOSSI
BLE MINING"
70 PRINT AT 10,12; INK 1;"STARING"
80 PRINT AT 12,15; PAPER 7;"+"
90 PRINT AT 14,11;"HYPER WIMP"
100 PRINT AT 16,4;"WRITTEN BY F.LEWIS 1
984."
105 PRINT AT 21,0;"PRESS ANY KEY TO PLA
Y Minermania"
```

Lines 30-106 Print the title screen.

```
110 FOR N=120 TO 255
111 OUT 0,0
112 OUT 0,6
113 OUT 0,3
120 POKE 23301,N: RANDOMIZE USR 23300:
IF IN 0<>255 THEN  GO TO 200
130 NEXT N
140 FOR N=255 TO 120 STEP -1
150 POKE 23301,N: RANDOMIZE USR 23300:
IF IN 0<>255 THEN  GO TO 200
155 OUT 0,0: OUT 0,60: OUT 0,5
160 NEXT N
```

Lines 110-160 This bit of code is just used to produce some flashy effects. Unfortunately, all this OUT 0,0 can cause the Speccy with Interface 1 to crash, so if you've got one fitted, take it off.

```
165 LET L=5: LET SR=0
166 LET DE=1
170 POKE 23301,120: POKE 23302,0: LET D
=250
171 PAPER 7: CLS : GO SUB D: LET D=D+10
0: FOR N=0 TO 255: RANDOMIZE USR 60051:
NEXT N: FOR N=56 TO 127: POKE 23504,N: P
OKE 23304,N: RANDOMIZE USR 23300: RANDOM
IZE USR 23500: NEXT N
172 IF D=350 THEN  LET D=800
190 GO TO 171
```

Lines 165-190 This is the demo mode.

```
200 LET DE=0: LET T=0: FOR N=120 TO 163
STEP 2
210 PRINT AT T,0; INK 1; PAPER 7;,,
220 LET T=T+1
225 POKE 23301,N: RANDOMIZE USR 23300
226 OUT 50,50
230 NEXT N
235 GO TO 367
```

Lines 200-235 This sets up the main variables.

```
240 FOR N=0 TO 5: PRINT AT N,0; INK 4;
PAPER 5,,: NEXT N
250 PRINT AT 5,0; PAPER 5; INK 4;"■■■■■
■■■■■■■■■■■■■■■■■■■■■■■■■■■"
251 PRINT AT 21,0; PAPER 6; INK 2;"■■■■■
■■■■■■■■■■■■■■■■■■■■■"; INK 0; PAPER 7;"■
"
260 PRINT AT 0,31; PAPER 8; INK 6; BRIG
HT 8;"■"
270 PAPER 7
275 PRINT AT 1,25; PAPER 8; BRIGHT 8; I
NK 9;"■■■■■■"
280 FOR N=2 TO 4: PRINT AT N,25; PAPER
7;"      ": NEXT N
290 PRINT AT 3,26;"■";AT 3,29;"■"
300 FOR N=10 TO 19 STEP 3: PRINT AT N,0
; INK 0; PAPER 7;"■■■■■■■■■■■■■■■■■■■■■■
■■■■■■■■■■": NEXT N
310 PRINT AT 9,0; PAPER 7;"■■     ■■     ■
■■ ■■ ■■       ■■     ■■"
320 PRINT AT 12,0; PAPER 7;"■■     ■■     
■ ■■      ■■      ■■     ■■"
330 PRINT AT 15,0; PAPER 7;"■■          ■■
■ ■■           ■■     ■■"
340 PRINT AT 18,0; PAPER 7;"■■          ■■
    ■■          ■■    ■■"
355 PRINT AT 7,0;"■■■■■■■■■■■■■■■■■■■■■■■■■■
■■■■■■■■■■■"
365 POKE 23301,120: POKE 23305,0
366 RETURN
```

Lines 240-366 This routine prints the particular screen you're about to enter.

```
367 GO SUB 240
370 FOR N=26 TO 24 STEP -1: PRINT AT 21
,N;"+ ": RANDOMIZE USR 23300: PRINT AT
21,N;"+": RANDOMIZE USR 23300: NEXT N
```

Lines 367-370 This prepares for the start of the game.

```
375 LET DE=1: LET L=5: LET SC=0
376 LET SR=700
380 LET U=0
381 LET DE=0: LET SR=SR+100
386 LET X=21: LET Y=24
```

Lines 375-386 This sets up some more variables.

```
387 FOR N=1 TO L: PRINT AT 21,26+N; INK
8; PAPER 8;"+": NEXT N
```

Line 387 Displays the amount of lives left graphically.

```
400 RANDOMIZE USR 60051: PRINT AT X,Y;
PAPER 8; INK 8;CHR$ PEEK 23296
```

```
401 IF INT U=1 THEN  PRINT AT 21,0; PAP
ER 6; INK 2;"                              "
; INK 0; PAPER 7;"■";
402 IF INT U=2 THEN  LET U=0
403 LET U=U+.2
405 RANDOMIZE USR 60051: PRINT AT X,Y;
PAPER 8; INK 8;CHR$ PEEK 23296
```

Lines 400-405 This is the start of the main loop.

```
420 IF IN 57342=251 AND Y>0 THEN  LET Y
=Y-1: PRINT AT X,Y; PAPER 8; INK 8;"  "
: POKE 23296,148
430 IF IN 57342=254 AND Y<30 THEN  LET
Y=Y+1: PRINT AT X,Y-1; PAPER 8; INK 8;"
 ": POKE 23296,151
440 IF IN 32766=251 THEN  GO SUB 510
```

Lines 420-440 This section reads the keyboard.

```
445 IF POINT ((Y*8)-2,175-(X*8)-4)=1 TH
EN  GO SUB 590
446 IF POINT ((Y*8)+10,175-(X*8)-4)=1 T
HEN  GO SUB 590
```

Lines 445-446 Has the miner been hit by a truck?

```
447 IF INT U=0 THEN  PRINT AT 21,0; PAP
ER 6; INK 2;"                              "
; INK 0; PAPER 7;"■"
448 RANDOMIZE USR 60051: PRINT AT X,Y;
PAPER 8; INK 8;CHR$ PEEK 23296
500 GO TO 400
```

Lines 447-500 Animate the flames at the bottom of the screen.

```
510 POKE 23301,120: POKE 23305,0
515 IF X<8 THEN  GO SUB 650
520 PRINT AT X,Y; PAPER 8; INK 8;" "
530 FOR N=X-1 TO X-2 STEP -1
540 PRINT AT N,Y; PAPER 8; INK 8;CHR$ P
EEK 23296
550 PRINT AT N+1,Y; INK 8; PAPER 8;" "
560 RANDOMIZE USR 23300
570 NEXT N
575 LET X=X-3
576 PRINT AT X+1,Y; PAPER 8; INK 8;" "
580 RETURN
```

Lines 510-580 This routine is called once the man reaches the top of the screen — t'house at t'pithead.

```
590 PRINT AT 21,26;"      ": POKE 23305
,0: FOR N=0 TO 200 STEP 5: POKE 23301,N:
RANDOMIZE USR 23300: NEXT N
600 PRINT AT X,Y; INK 8; PAPER 8;" ": L
ET X=21: LET Y=24: LET L=L-1
605 IF L<1 THEN  GO TO 620
610 GO TO 386
```

Lines 590-610 Kill man when he's hit by a truck.

```
620 PRINT AT 10,11;"GAME OVER"
621 FOR N=120 TO 255: POKE 23301,N: RAN
DOMIZE USR 23300: NEXT N
630 PAUSE 0
640 GO TO 10
```

Lines 620-640 This is the game over routine.

```
650 PRINT AT X,Y; PAPER 8; INK 8;" "
660 FOR N=Y TO 26
670 PRINT AT 4,N; BRIGHT 8; PAPER 8; IN
K 9;"  "
680 PAUSE 10
690 PRINT AT 4,N; BRIGHT 8; PAPER 8; IN
K 9;"  "
700 PAUSE 10
710 NEXT N
```

Lines 650-710 Make the man run home.

```
720 FOR N=56 TO 127
730 POKE 23504,N
740 RANDOMIZE USR 23500
750 POKE 23301,127-N: RANDOMIZE USR 233
00
760 NEXT N
```

Lines 720-760 Flash the screen using a machine code subroutine.

```
770 POKE 23504,56: RANDOMIZE USR 23500
780 GO SUB 8000
```

Lines 770-780 End-of-screen routine.

```
800 FOR N=0 TO 5: PRINT AT N,0; PAPER 0
; INK 7; BRIGHT 1;,,: NEXT N
810 FOR N=175 TO 175-(6*8) STEP -1: PLO
T  INK 8;RND*255,N: NEXT N
815 GO SUB 250: PRINT AT 0,31; PAPER 0;
" "
820 FOR N=6 TO 20: PRINT AT N,0; PAPER
0; INK 0; OVER 1;"      ": NEXT N
825 PRINT AT 9,4;"  ";AT 9,23;"  "
826 PRINT AT 12,17;"  ";AT 18,20;"  "
829 IF DE=1 THEN  RETURN
830 GO TO 380
```

Lines 800-830 1st screen.

```
900 FOR N=0 TO 5: PRINT AT N,0; PAPER 5
; BRIGHT 1;,,: NEXT N: GO SUB 250
910 PRINT AT 18,19;"     "
920 PRINT AT 9,4;"  ";AT 9,23;"    ";A
T 12,17;"    "
929 IF DE=1 THEN  RETURN
930 GO TO 380
```

Lines 900-930 2nd screen.

```
1000 FOR N=0 TO 5: PRINT  PAPER 2;,,: NE
XT N
1001 GO SUB 250
1010 PRINT AT 9,4;"   ";AT 9,23;"    "
1020 PRINT AT 18,19;"     "
1030 PRINT AT 12,17;"   "
1039 IF DE=1 THEN  LET D=1900: RETURN
1040 GO TO 380
```

Lines 1000-1040 3rd screen.

```
2000 FOR N=0 TO 5: PRINT AT N,0; PAPER 1
;,,: NEXT N: GO SUB 250
2010 PRINT AT 9,0;"
                "
2011 PRINT AT 12,0;"
                "
2012 PRINT AT 15,0;"
                "
2013 PRINT AT 18,0;"
                "
2014 FOR N=6 TO 20: PRINT AT N,0; PAPER
0; INK 0; OVER 1;"      ": NEXT N
2015 IF DE=1 THEN  RETURN
2016 LET SR=2000: GO TO 380
```

Lines 2000-2016 4th screen.

```
2100 FOR N=0 TO 5: PRINT AT N,0; PAPER 6
;,,: NEXT N
2110 GO SUB 250
2120 FOR N=6 TO 18: PRINT AT N,0; OVER 1
; PAPER 0; INK 0;"    ";AT N,28;"    ";
NEXT N
2125 IF DE=1 THEN  RETURN
2130 GO TO 380
2135 IF DE=1 THEN  RETURN
```

Lines 2100-2135 5th screen.

```
2200 FOR N=0 TO 5: PRINT AT N,0; PAPER 3
; BRIGHT 1;,,: NEXT N
2210 GO SUB 250
2220 FOR N=6 TO 18: PRINT AT N,0; OVER 1
; PAPER 6;,,: NEXT N
2230 PRINT AT 12,0; OVER 1; PAPER 0; INK
0;"      "; PAPER 7;"      ";
PAPER 0; INK 0;"      "
2231 IF DE=1 THEN  RETURN
2240 GO TO 380
2300 FOR N=0 TO 5: PRINT AT N,0; PAPER 1
```

Lines 2200-2240 6th screen.

```
2400 FOR N=0 TO 5: PRINT AT N,0; PAPER 4
```

```
;,,: NEXT N
2410 GO SUB 250
2420 PRINT AT 9,0;"
   "
2430 PRINT AT 12,0;"
   "
2440 PRINT AT 15,0;"
   "
2450 PRINT AT 18,0;"
   "
2455 IF DE=1 THEN  RETURN
2460 GO TO 380
```

Lines 2400-2460 8th screen.

```
2500 GO SUB 250
2505 PRINT AT 9,0;,,
2506 PRINT AT 9,5; INVERSE 1;"NOW THIS I
S EASY"
2507 IF DE=1 THEN  RETURN
2510 GO TO 380
```

Lines 2500-2510 9th screen.

```
2600 FOR N=0 TO 5: PRINT AT N,0; PAPER 4
; INK 6; FLASH 1;,,: NEXT N
2610 GO SUB 250
2620 PRINT AT 9,0; INVERSE 1;"LAST STAGE
 LAST STAGE"
2630 PRINT AT 12,0;"
   "
2640 IF DE=1 THEN  FOR N=0 TO 255: RANDO
MIZE USR 60051: NEXT N: GO TO 10
2700 LET SR=700: GO TO 380
```

Lines 2600-2700 10th screen.

```
8000 FOR N=0 TO 21: PRINT AT N,0;,,: NEX
T N
8010 LET SC=SC+RND*400: PRINT AT 1,0;"YO
UR SCORE SO FAR:";INT SC;AT 3,0;"THE HIG
H SCORE IS ";("STILL" AND HI>SC)+("NOT"
AND SC>HI);" ";HI: PRINT ''("SO YOU HAVE
 TAKEN IT" AND SC>HI)
8020 PRINT AT 21,0;"PRESS ANY KEY TO SEE
 NEXT SCREEN"
8030 PAUSE 0: CLS
8040 GO TO SR
```

Lines 8000-8040 Print the between-screen message.

```
9000 DATA 23300,33,20,0,17,20,0,195,181,
3
```

Line 9000 Data for the machine code sound.

```
9010 DATA 23500,33,0,88,54,57,35,62,91,1
88,40,2,24,246,201
```

Line 9010 Data for the machine code flash.

```
9020 DATA 60000,14,8,175,229,17,31,0,237
,82,126,25,23,6,32,126,23,119,43,16,250,
225,36,13,32,233,201
9030 DATA 14,8,229,17,31,0,25,126,237,82
,31,6,32,126,31,119,35,16,250,225,36,13,
32,234,201
9035 DATA 33,64,80,205,122,234,33,255,72
,205,96,234,33,128,72,205,122,234,33,63,
72,205,96,234,201
```

Lines 9020-9035 Data for the machine code pixel left/right scroll.

```
9040 DATA 65368,0,0,127,127,55,43,20,8,0
,0,254,254,236,212,40,16,81,132,18,64,8,
161,247,255,0,0,255,255,255,255,0,0,24,2
4,8,126,24,8,8,24,48,48,16,126,24,38,66,
64
9050 DATA 12,12,8,126,24,100,66,2,24,24,
16,126,24,16,16,24,130,73,34,144,72,161,
247,255,82,251,215,126,235,175,255,255,2
55,85,255,0,0,0,0,0
9060 DATA 0,0,255,255,247,235,20,8,189,1
26,255,255,189,66,165,66,1,3,5,11,23,47,
95,255,128,192,160,208,232,244,250,255,2
55,153,153,255,255,153,153,255,66,36,24,
255,247,235,20,8
```

```
9070 DATA 102,255,102,255,247,235,20,8,1
29,66,60,255,24,102,165,66,239,15,39,195
,16,37,73,1,0,0,255,255,231,195,60,24
9100 DATA -1
```

Lines 9040-9100 Data for UDGs.

```
9105 RESTORE 9000
9107 LET C=0
9110 READ a: IF a>255 THEN  LET n=a: GO
TO 9110
9120 IF a=-1 THEN  GO TO 9140
9130 LET C=C+A: POKE n,a: LET n=n+1: GO
TO 9110
9140 IF C<>28067 THEN  PRINT "DATA ERROR
,  TRY CHEAKING UDG'S FOR ERROR": PRINT
''"CHEAKSUM SHOULD=28067"'"BUT IT =";C:
PRINT ''"DO THESE LOOK CORRECT
 [illegible]": STOP
9150 GO TO 3
```

Lines 9105-9150 Poke in UDG data and machine code data.

```
9999 SAVE "Minermania" LINE 2
```

Line 9999 Save game.

COPY RIGHT

by Peter Featherstone

C'mon all you copy cats! How many screeens are you just itching to change into hard copy form straight from your software? Or save a copy of the screen onto tape so that you can exercise your creative talents on it later. Well, now this program lets you get at them.

So, how do you use it? Just type in the Basic listing, run it, save it and then type Randomise Usr 65120 before loading the program with the required screen. When you reach the right screen, press Record/Play on your tape recorder and then press Caps/S on your Speccy. That's it! Your screen should now be saved.

OK, so you're saying it all sounds just a bit too easy. Well, there are some programs that are so big that they'll overwrite the routine. And it won't work with others because they switch off the interrupts. Still, you shouldn't have any problems with most programs.

For the technical buffs, the routine starts at 65120, it's 88 bytes long and it's not relocatable. OK, copy?

```
10 LET LINE=1000
20 FOR F=65120 TO 65200 STEP 8
30 LET TOT=0
40 FOR G=0 TO 7
50 READ A
60 POKE (F+G),A
70 LET TOT=TOT+A
80 NEXT G
90 READ B
```

Lines 10-90 Set up initial variables and POKE in machine code data.

```
100 IF TOT<>B THEN  PRINT "ERROR IN LIN
E ";LINE: STOP
```

Line 100 Checks the checksum for errors.

```
110 LET LINE=LINE+10
120 NEXT F
```

Lines 110-120 Continue with loop.

```
130 PRINT "ALL OK"
140 STOP
```

Lines 130-140 Stop the program once completed.

```
200 SAVE "SCREENCOPY"CODE 65120,88
210 STOP
```

Lines 200-210 Save the program.

```
1000 DATA 62,9,237,71,237,94,201,0,911
1010 DATA 0,255,243,245,229,205,116,254,
```

This program's on Digi'T'ape – see page 57

```
1547
1020 DATA 225,241,251,201,62,254,219,254
,1707
1030 DATA 230,1,40,1,201,62,253,219,1007
1040 DATA 254,230,2,40,1,201,221,33,982
1050 DATA 165,254,62,0,17,17,0,205,720
1060 DATA 194,4,6,50,118,16,253,221,862
1070 DATA 33,0,64,62,255,17,0,27,458
1080 DATA 205,194,4,201,0,3,115,99,821
1090 DATA 114,101,101,110,32,32,32,32,55
4
1100 DATA 0,27,0,64,14,128,0,0,233
```

Lines 1000-1100 Machine code data.

EDIT KEY

KEVIN SWIFT

This program's on Digi'T'ape – see page 57

Cast your minds back — many moons (and issues ago), *YS* projects manager, Penny Page, set you all a small task. How, she asked, could you alter the Speccy's editing facilities so that the cursor should be moved up and down an edit line, as well as from left to right. At last, we bring you a solution to the problem.

To get it going just type in the loader program, run it and save it as usual. Then to start the routine type Randomise Usr 65123. To disable it, type Randomise Usr 65133. You can also change the speed of the cursor simply by entering:
POKE 65053, new value
POKE 65065, new value.
The new value is the number of characters to be moved each time.

OK, put on the green eye shade (*just like the one I wear! Ed*) and get editing.

```
   1 REM Edit Keys
   5 CLEAR 65000: LET cs=0
  10 FOR i=65023 TO 65133
  20 READ a: POKE i,a: LET cs=cs+a
  30 NEXT i
  40 IF cs<>11802 THEN  PRINT "ERROR IN
DATA": STOP
  50 SAVE "Editkey"CODE 65023,120
 100 DATA 1,254,255,243,245,229,197,213,
58,8
 110 DATA 92,254,10,40,7,254,11,40,3,195
 120 DATA 90,254,254,10,40,12,42,91,92,1
 130 DATA 31,0,167,237,66,229,24,8,42,91
 140 DATA 92,1,31,0,9,229,42,97,92,43
 150 DATA 43,193,197,167,237,66,56,39,42
,89
 160 DATA 92,193,197,167,237,66,48,29,22
5,34
 170 DATA 91,92,58,8,92,254,10,32,7,62
 180 DATA 9,50,8,92,24,5,62,8,50,8
 190 DATA 92,209,193,225,241,251,201,225
,24,247
 200 DATA 58,0,254,214,1,237,71,237,94,2
01
 210 DATA 62,63,237,71,237,86,201,0,0,0
```

```
0100 K48    DEFL OFDFFH
0150        ORG  K48
0200 VECTR  DEFW K48+2
0250        RST  38H
```

Line 250 Calls the ROM routine that reads the keyboard and updates the system variable FRAMES.

```
0300        DI
0350        PUSH AF
0400        PUSH HL
0450        PUSH BC
0500        PUSH DE
0550        LD   A,(23560)
```

Line 550 Loads 'A' with the value of the last key if or the 'NO-KEY' value.

```
0600        CP   10
0650        JR   Z,START
```

Lines 600-650 Check if the last key was Cursor Down. If so jump to START.

```
0700        CP   11
0750        JR   Z,START
```

Lines 700-750 If the last key pressed was up then also jump to 'START'.

```
0800        JP   END
```

Line 800 If neither up or down was pressed then jump to 'END'.

```
0850 START  CP   10
0900        JR   Z,ADD
```

Lines 850-900 If DOWN was being pressed then jump to 'ADD'.

```
0950        LD   HL,(23643)
1000        LD   BC,31
1050        AND  A
1100        SBC  HL,BC
1150        PUSH HL
1200        JR   TEST
```

Lines 950-1200 Assuming that up must have been pressed read the cursor position, move 31 characters down the line and jump to 'TEST'.

```
1250 ADD    LD   HL,(23643)
1300        LD   BC,31
1350        ADD  HL,BC
1400        PUSH HL
```

Lines 1250-1400 Read the cursor position. Move 31 characters up the line.

```
1450 TEST   LD   HL,(23649)
1500        DEC  HL
1550        DEC  HL
1600        POP  BC
1650        PUSH BC
1700        AND  A
1750        SBC  HL,BC
1800        JR   C,END1
```

Lines 1450-1800 Test to see if the cursor is going off the end of the line, and if so jump to 'END1'.

```
1850        LD   HL,(23641)
1900        POP  BC
1950        PUSH BC
2000        AND  A
2050        SBC  HL,BC
2100        JR   NC,END1
2150        POP  HL
```

Lines 1850-2100 Test to see if the cursor is going too far up line, if so then jump to 'END1'.

```
2200        LD   (23643),HL
```

Line 2200 Stores the news cursor position.

```
2250        LD   A,(23560)
2300        CP   10
2350        JR   NZ,UP
```

Lines 2250-2350 If DOWN wasn't the last key pressed then jump to 'UP'.

```
2400        LD   A,9
2450        LD   (23560),A
2500        JR   END
```

Lines 2400-2500 Make Basic think that cursor right was pressed and jump to 'END'.

```
2550 UP     LD   A,8
2600        LD   (23560),A
```

Lines 2550-2600 Make Basic think that cursor left was pressed.

```
2650 END    POP  DE
2700        POP  BC
2750        POP  HL
2800        POP  AF
2850        EI
2900        RET
2950 END1   POP  HL
3000        JR   END
```

Lines 2650-2900 Restore all preserved registers, enable interrupts and return to Basic.

```
3050 GO      LD    A,(VECTR+1)
3055         SUB   1
3100         LD    I,A
3150         IM2
3200         RET
```

Lines 3050-3200 Set up interrupt routine, set interrupt mode 2 and return to Basic.

```
3250 STOP    LD    A,3FH
3300         LD    I,A
3350         IM1
3400         RET
3450         END
```

Lines 3250-3400 Switch the routine off by setting interrupt mode 1 and return to Basic.

OPPORTUNITY KNOCKS!

The search is on. *YS* is looking for the greatest, hottest, brightest Speccy programmers around. Sounds like you. Read on ...

Last month we told you about our search for the *Your Spectrum* Supreme Programmer. Well, it's hotting up already. For the duffers who didn't read about it then, we'll recap.

If you've written a program that you reckon's hot stuff, now's the time to send it to us. We don't mind if it's an arcade, and adventure, a utility or whatever or if it's in Basic, MegaBasic or machine code — just so long as it does what it sets out to do. Games should be fun and utlities must be original and hard-working.

We're not really imposing any restrictions. Well not many anyway! The first is on the size of the programs. Last month we asked you not to go over 15K. If you're up to about 14.5K now — STOP! I'm afraid the gremlins crept in. That should've read 5K 'cos there's no way we can publish anything much longer than that. Sorry if that means you've now got to start chopping chunks out of your code. And where were all you trainspotters then?

The only other problem concerns programs that contain attribute control characters within Basic program lines — those are the ones you get using extended mode 0 to 9. Don't use them, cos we can't print them out and this does serious damage to programs that use the ATTR function.

We'll be printing six of the best programs over the next six months and then it'll be up to the thousands of *YS* readers to vote for their fave program. As well as being published and generously paid for, the six picked programmers will also receive royalties on the tape versions — see this month's Frontlines and the ad from Digi'T'ape for the details.

When you make your final choice from the six best, we'll be talking to a number of big software houses about tapping all that talent. More details follow.

For now, fill in the form below (or a photocopy of same) and get programming. As the man says, don't knock it till you've tried it!

Opportunity knocked and I answered — here is my Megaprogram. It sure gets my vote as the program of the year!

Name..............................

Address..............................

....

.... *Postcode* ....

My program's called..............................

....

»INPUT'OUTPUT

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» SOFTWARE

■ Spectrum software to swop for games or peripherals, ie Lightpen, Stack Rifle, printer or ZX81 & manuals. Send for list to Gad. Shaw, 25 Redwood Avenue, Royston, Barnsley, S. Yorks.

■ Swop two of the following; *Android II, Ant Attack, Artic Humpty* series and others for *The Quill*. Tel (06517) 2838 (after 4pm) and ask for Brian.

■ Swop *Strange-Loop* for *Sabrewulf* or *Fall-Guy*. Tel: Yatton 833567 and ask for Julia.

■ Swop *Raid over Moscow, Pitfall 2, Zaxxon, Alien 8, Witch's Cauldron, Airwolf* etc. Write to Paul Ledger, 2 Henconner Garth, Chapel-Allerton, Leeds LS7 3RZ.

■ Will swop *Fred, Trashman, Underwurdle, Starship Enterprise, Ant Attack, Night Gunner, Pyramid, JSW* for *Knightlore, Ad Astra, Space Shuttle* or *W.H.Y.* Tel. 061-747 3130 and ask for Dave.

■ Spectrum software to swop. Send your list for mine and sae or Tel. (0642) 605662 and ask for Dave.

■ Swop *Timebomb, Planet of Death* or *Mr. Freeze* for *Pole Position, Underwurdle, Cyclone, Zombie Zombie, Airwolf* or any other recent popular games. Tel. (033 981) 594 and ask for James.

■ Swop VU-Calc for any business or utility program. Tel. Oxted Surrey 6175 and ask for SF Clark.

■ Swop *3D Tank, Cricket Captain, Royal Birkdale, Braxx Bluff, 3D Lunattack* for *Survival, Pitfall II, Combat Lynx, Make a Chip*. Write to Alan Belben, 18 Steppes Crescent, Martock, Somerset TA12 6EQ.

■ Will swop *Lords of Midnight, Make a Chip*, Atari Joystick and *Cascade 50* games tape for Datapen & appropriate interface. Write to Jeremy Housden, 14 Wharf View, Buckingham.

■ Swop software with me. Send your list for mine. Send sae. Also, does anyone want a broken, but fixable ZX printer cheap? Write to A B Murray, Saumarez Block, HMS Nelson, Portsmouth, Hants.

■ Swop *Hobbit, Hungry Horace* and *Inca Curse* all for *Quill* or help in how to program a simple adventure. Write to Terry Braverman, 23 Aragon Close, King's Hedges, Cambridge.

■ Swop software and ideas utilities and games. Any hackers in the area? Share BT costs. M J Adams, 112 Milton Road, Fallings Park, Wolverhampton, WV10 0ND.

■ Will swop *Devil Rides In* for either *Manic Miner, Knight Lore, Sabre Wulf, Lunar Jetman, Pole Position, Combat Lynx* etc. Tel. Winchester 883481 after 4.15pm and ask for Eddie.

■ Have *Snowball, Gift from the Gods, Monty Mole* and more to swop for a Currah MicroSpeech or good arcade games. Your list for mine. Write to Paul McMurtle, 23 Radstock Road, Stretford, Manchester M32 0AJ.

■ Swop *Knight Lore, Technician Ted, System 15000, Lunar Jetman* for *Machine Code Tutor*. Tel. 061-368 6935 and ask for D Spinks.

■ Have *Colditz, Skool Daze, Scrabble, Survival of the Wild Bunch, Booty, Byte Bitten* etc to swop for *JSW* and other games. Send offers to Ian Hoyle, 31 Livesey Branch Road, Blackburn, Lancs BB1 4QJ.

■ Swop *3D Combat Zone, Wheelie, Giant's Revenge* and *Blue Max* for the Dk'tronics Lightpen. Tel. 061-436 4875 (after 5.30pm) and ask for Denis.

■ Will swop *Fifth, PSS Compiler* and *The Crypt* for the *BLAST* compiler. Will sell for £20. Tel. (03902) 367 and ask for Simon.

■ Swop any of *Avalon, Pyramid, The Hobbit, Ant Attack, Hunchback, Penetrator, Booty, Timegate, Pimania* etc. Tel. Ascot 22750 and ask for Orlando.

■ I have about 600 titles to swop! Please send your list for mine. Write to Clemens Oelker, Woderichweg 5, 2000 Hamburg 63, West Germany.

■ Software worth £350 including *Tasword, White Lightning, Raid over Moscow, Ghostbusters, Skool Daze*. Send sae for list to J D Bisset, Inverberg Inn, Luss, Dumbartonshire G83 8PD.

■ Swop *Machine Lightning* for *Tasword, VU3D, Chequered Flag* and *Hungry Horace* and *YS MegaBasic*. Also send your list for mine. Tel. Bradford 679153 and ask for Damian.

■ Swop *Pitfall II, Doomsday Castle, Zip-Zap, Molar Maul, Caterpillar*, etc. Tel. Wellingborough 223552 (4-6pm) and ask for Ian.

■ *Avalon, Ghostbusters, Sabrewulf* and more wanted. Swop for *Manic Miner, JSW, Underwurlde, Full Throttle* etc. Tel. Stratford-on-Avon 69300 and ask for Martin.

■ Swop any five of *Backpackers, Valhalla, Battle Cars* and more for *Match Point* and *Zombie Zombie* etc. Tel. (0353) 860046 and ask for Glen.

■ Swop any of *Chequered Flag, Horace Goes Skiing, Dinky Digger, Master Mariner* and *Survival* for *Vufile, Vucalc, Bridge* or other serious software. Tel. (0732) 843323 and ask for W D Ogilvie.

■ Swop *Pitfall II, Danger Mouse, Grand National*, etc for *Formula I*, or any good sports games. Tel. Hull 506283 and ask for Steve.

■ Have *Valhalla, Monty Mole, Dark Star, Cyclone, Starstrike, Full Throttle, Daley's Decathlon* etc. Any four for *Quill* or *White Lightning*. Write to John Cameron, 36 Kingsland Avenue, Glasgow G52 2NF.

■ Swop *Genesis II, Orbiter* and *Ground Attack* for either *Knightlore, Lords of Midnight* or *Zombie Zombie*. Tel. (0642) 551256 (after 4.30pm) and ask for Richard.

■ Swop *White Lightning* and *Jungle Fever* for either *HURG* and *YS MegaBasic* or *Machine Lightning*. Write to G Carling, 15 Station Road, Nassington, Peterborough PE8 6QB.

■ Adventurers! *Valhalla* and *The Hobbit*, boxed with manuals. Offers to A Wiseman, 68A Mayfield Road, Hartford, Huntingdon, Cambs. PE18 7NJ.

■ Swop *JSW* and/or *Beach Head* for *Quill*. Tel. Uttoxeter 3782 and ask for Chris.

■ Swop *Mutant Monty, Tribble Troubble, Booty, Menace* and more. Your list for mine to Steven Smart, 118 Hancross Road, Stopsley, Luton Beds, LU2 8JF.

■ Will swop *Ghostbusters, D.T. Decathlon, Zzoom* and *Chequered Flag*, for *White Lightning* and *Match Day*. Your list for mine. Write to D Wheatley, 20 Tudhoe Moor Estate, Spennymoor, Co. Durham, DL16 6HA.

■ I have *Ghostbusters, 1984, Splat, Scrabble, BMX Racers* etc. Would like any decent adventures. Tel. Plymouth 339361 and ask for Mark.

■ Swop any three of *Quest, Ship of the Line, Micro Oylmpics, Avalon, TLL* for *White Lightning* or any good new games. Write to S White, 1 Umfula Place, St Ives, Cornwall TR26 1QF.

■ Swop many games including *Technician Ted, Monty is Innocent, Airwolf, Ghostbusters* and *Gift from the Gods*. Send sae to Christopher Jenkins, 48 Gadlys Street, Aberdarem, Mid Glamorgan, S Wales CF44 8BH.

■ *Complete Machine Code Tutor* wanted with manuals. Swop for software. I have many new titles including *Airwolf, Xavior*. Write to Jens Norgard, Alssundevej 24, 6400 Sonderburg, Denmark.

» HARDWARE

■ Saga Systems keyboard for sale. Spare set of keyboard transfers. £25 ono. Tel (08267) 423 after 6pm and ask for D. Edwards.

■ ZX81 minus aerial lead £25. Broken 16K RAMpack for ZX81, £10 plus free 'wobble stopper'. Also software £1 per tape. Tel. 01-330 2929 and ask for Jason.

■ Will sell ZX Spectrum+, 22 games, interface, joystick, all two months old, worth £240. Accept £190 ono. Tel. Norwich 628377 x3472 after 8pm and ask for Dominique.

■ Spectrum 48K and Interface 1, and Microdrive — £125. Watford SPDOS 400K disk drive and interface £200, Kempston E interface £25. Tel. (0532) 539914 and ask for Anthony.

■ 48K Spectrum, cassette recorder, best software worth £180. Books and mags including complete set of *YS*. Everything as new. Bargain at £125. Tel. 021-474 6202 and ask for Steve.

■ Swop Downsway Programmable Memory Joystick interface for any Currah MicroSpeech with demo tape. Tel. Hull (04321) 881552 and ask for Alistair.

■ Desperate Speccy owner must lay hands on Currah MicroSpeech. Swop for any 5 of *Space Station Zebra, Trashman, Molar Maul, Bear Bovver, Hubert, Timezone*. Send your list for mine too! Write to David McGibbon, 12 Philip Road, Durrington, Nr. Salisbury, Wiltshire, SP4 8OT.

■ Currah MicroSpeech Unit. Only £22.95. I've taken £7 off! Also swop *LOM* by Beyond for *Alien 8* by Ultimate and *TLL* and/or *Trashman* for anything. Tel. Northampton 862722 and ask for Max.

■ Currah MicroSpeech with Demo/Instructions. £20. ZX Printer paper, 6 rolls — £13. Postage included. Tel. (020488) 5283 and ask for M. Smith.

■ 48K Spectrum, ZX Printer — with paper, cassette recorder, software, books, blank tapes, all leads, manuals etc. All in mint condition — all for £110. Chris Hall, 51 Clevely Park, Belfast BT8 4NB.

■ ZX Printer, boxed with instructions in excellent condition. Tel. Bagshot (0276) 71009 and ask for C Parkinson.

■ 16K ZX81 with 17 games. New! Sell for £40. Still boxed. Tel. 041-762 1442 and ask for Mark.

■ Programmable joystick interface to fit Sinclair ZX Spectrum. As new, hardly ever used. Complete with box and instructions — £15. Phone (0536) 723843 after 4.30pm and ask for Paul.

■ For sale, Currah MicroSpeech £25. Fuller Sound Box £25. Interface II £15, all with instructions. Nearest offer secures. Please send sae to Mr. A E Fisher, 15 Alvord Avenue, Prestwick, Ayrshire KA9 2JU.

■ Sell CGP115 Graphic Printer plus leads to Interface 1 for £100. Tel. (0245) 465804 and ask for Barry.

■ Will swop Currah MicroSpeech unit for Dk'Tronics lightpen or *White Lightning*. Write Lightning. Write to Sean Lane, 40 Sun Lane, Gravesend, Kent DA12 5HG.

■ Currah MicroSpeech swop for ZX Printer of joystick and Interface. Write to Mr A Laws, 3 Church Farm Cottages, Stockton, Beccles, Suffolk NR34 0HJ.

■ Swop Cheetah Rat for any lightpen and interface or programmable joystick interface. Tel. (0602) 256447 and ask for Mark.

■ Will swop *Ghostbusters, Space Shuttle, Decathlon, Kong* and *Zip Zap* for ZX Printer with paper. Tel. 01-778 9716 and ask for Michael. Must be able to travel to the Penge area of London.

■ 48K Spectrum, Dk'Tronics Keyboard, Currah MicroSpeech unit, edge connector expansion ribbon and about 30 games. Worth more than £350, will accept £200. Tel (0539) 25528 after 5pm and ask for Adam.

■ Interface 1, 2 Microdrives, 5 cartridges. Sell for £75. All brand new — unwanted gifts. Tel. 061-231 3937 after 7pm and ask for Trevor.

■ 32K ZX81, professional keyboard, soundboard, inverse, load/save switches, 5 amp p/supply, loudspeakers. All built into luxury cabinet. (TV sits ontop). With 90 games, utilities, Ass/Diss, Basic + M/C books. £80 ono. Tel. 061-860 4668 and ask for D. Williams.

■ ZX Printer and 5 rolls paper £10. Write to Mr G A Hope, 72 Picket Close, Fordingbridge, Hants SP6 1JY.

■ Have *White Lightning*, will swop for common interface or selected software. Tel. (0202) 697477 and ask for Kevin.

■ ZX printer, 5 rolls of paper and Saga Emperor keyboard. Cost £108 sell for £70 or swop for ZX expansion set. Tel. 01-737 7350 and ask for J H Davies.

■ 48K Spectrum for sale, Dk'tronics programmable interface, Wico joystick, £200 worth of software (new games). Sell for £100 ono. Tel. 01-876 6978 and ask for Paul.

■ For sale, 1 on/off switch and reset button for ZX 81 or Spectrum. Write to Ian Clarke, 22 London Street, Andover, Hampshire SP10 2PE.

■ Wanted, an Alphacom Printer. Will swop Stonechip echo amplifier, *Lunar Jetman, Ant Attack*, etc. Also, send software list for mine. Tel. (0703) 771497 and ask for Mike.

■ Will swop Quickshot II for Kempston, and Cambridge joystick for Currah MicroSpeech. Tel. Torphins 210 and ask for Andrew.

■ Ni-Cad battery charger plus large stock of AA Penlite Ni-Cads. Sell £7. Tel. 01-527 5493 and ask for Freddy.

■ Interface 1 and Microdrive, plus 4 cartridges and software. £80 ono. Tel. (0274) 572218 and ask for Steve.

■ 48K Spectrum, Currah MicroSpeech, Kempston Joystick interface, cassette recorder, Quickshot II joystick £207, plus £200 worth of software. Want £210 ono. Tel. 061-740 3397 and ask for Garry.

■ Dk'tronics Lightpen £15, Cambridge programmable interface £20 ono. Quickshot I joystick £3 ono. Tel. (0752) 50139 and ask for Paul.

■ Dk'tronics Lightpen in good condition. Will sell for £14 or swop for software. Tel. (06065) 50155 and ask for Paul.

■ For sale ZX81 16K with leads and manual. £30 or swop for Dk'tronics lightpen. Tel. 415354 and ask for Mike.

■ I need a William Stuart Systems Music Synth control port for a Currah MicroSpeech. Both in good condition. Tel. Peterborough 264030 and ask for Paul.

■ 48K Spectrum £75. On/Off switch £4.50. TV/Computer aerial switch £2. Save/Load switch £4.50. Last three for £10. Tel. (0264) 61581 on Saturday and Sunday opening hours and ask for Ian.

■ Protek Joystick Interface and Atari Joystick ideal for beginners. Will throw in *Time Bomb*. £20 ono. Ian Clarke, Kings Head, Andover, SP10 2PE.

■ For sale — Dk'tronics keyboard with full width space bar in original box, cost new £37 will accept £27 ono. Tel. 01-958 7850 and ask for Mr Rabbie.

■ Swop Dk'tronics lightpen for *Valkyrie 17* or other good software, or will sell for £11. Write to Stephen Trask, 34 Mitchell Hey, Rochdale.

■ Downsway joystick £15 or swop for Currah MicroSpeech. Also Intellevision and 3 cartridges £50 or swop for Dk'tronics keyboard with space bar, or swop both for Alphacom 32 Printer. Write to Alan Watkins, 23 Key Road, Clacton-on-Sea, Essex CO15 3DA.

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»INPUT'OUTPUT

■ RAM Turbo interface £15 ono. Currah MicroSpeech £20, both hardly used. Sell together £30. Tel. (0295) 51279 and ask for Simon.
■ Swop *Ghostbusters* and *Scrabble* for Quick Shot II joystick and Spectrum interface. Tel. Nelson 64371 and ask for Craig.
■ ZX Spectrum with joystick and interface and data recorder, all under guarantee with boxes, mags and £650 worth of software. Value £870. Bargain at £350. Tel. Marshland Smeeth 276 and ask for D. Roofe.
■ Swop Dk'tronics Lightpen for Kempston interface or ZX printer. Tel. Kidderminster 751042 and ask for Robert.

» WANTED

■ Kempston Pro 5000 Joystick wanted. Will swop for Quickshot II. Must be in good condition. Tel. C. Dawson (N. Ireland) 68662 and ask for Simon.
■ Currah MicroSpeech. Willing to give £30 worth of software including *Alien 8, LOM, Trashman* (1 & 2) and others. Craig Geddes, 32 Muirhall Road, Thornhill DG3 5NT.
■ Wanted: A Prism VTX 5000 Modem for use with Micronet 800 system. Hopefully under £50. Write to Jon Yates, 9 Court Haw, Woodmansteane, Banstead, Surrey SM7 3NG.
■ Wanted, *YS* issue 4; will pay £3. Tel. (0245) 81525 and ask for Steve.
■ Hardware Add ons wanted (especially disk drive, printer). Swop with software, I have many new titles. They include *Astrogolf, Xavior.* Write to Jens Norgard, Alssundej 24, 6400 Sonderburg, Denmark. Or Tel. 00944-4-486605 after 8 pm and ask for Jens.
■ Wanted: Spectrum + £70 offered, lesser Speccies considered by this ageing latecomer itching to upgrade from ZX81! Write to John Nicol, Overboddam, Insch, Aberdeenshire, Scotland AB5 6NA.
■ *YS* issue 2 wanted. Will swop for issues 1, 5 and 8. Write to G. Carling, 15 Station Road, Nassington, Peterborough PE8 6QB.
■ Wanted! *Cavelon, Everyone's A Wally, Moon Cresta, Technician Ted, Zaxxon, Brian Bloodaxe, BJ Superstar, Hunchback II, Match Point, Monty Mole, Avalon, Bruce Lee, ROM, Cyclone, Snooker, TKV.* Tel. 01-393 3920 evenings and ask for Alistair.
■ Wanted! Dk'tronics Lightpen or BLAST compiler. Will swop with four top Spectrum games. Eg. *Cyclone, Stagecoach, B. George, B. Bluff, WTHAS,* many more! Contact G.A.D. Shaw, 25 Redwood Avenue, Royston, Barnsley, Yorkshire, S71 4JP.
■ Spectrum compatible modem wanted: Unicom, or VTX 5000. Swop for PT-20 Casio organ, proper keys, chords, base/beat accompaniment. Sell organ or swop. Tel. 01-699 7093 and ask for Richard.
■ Deceased Speccy required to further life of sick "Sarah Spectrum". Must be issue 2. Max £30 quid? Please write to Pete Taffs, 216 Mancroft Road, Aley Green, Luton, Beds. LU1 4DR.
■ Wanted *Finance Manager, Omnicalc,* Softek *Compiler.* I can offer *Tasword, Tasprint, Tasmerge, Masterfile* or variety of games. Tel. (06512) 2250 and ask for Bob.
■ Urgent Plea! 48K Spectrum wanted in good condition with manual, leads etc. Preferably under guarantee. Tel. Teesdale 38603 and ask for Neil.
■ Wanted: any good Spectrum software, mainly *Alien 8.* Will swop for other software. Tel. (0532) 633005 and ask for Graham.
■ Will swop original *Knightlore* map for *Atic Atac* map. Please include own address. Write to Paul Kelly, 57 Emmanuel Road, Burntwood, Nr Walsall, Staffs. WS7 9AD.
■ Wanted: any programs for roulette, black-jack, horse-racing or pools, etc. Write to P. Dimitzis, 25 London Street, London W2.
■ Wanted: Currah MicroSpeech or ZX Printer for *World Cup, Full Throttle, Kong Strikes Back, Pitfall 2, Grand National, Cascade 50, Danger Mouse in Double Trouble* and *Chess.* Tel. (0482) 506283 and ask for Steve.
■ Issues 2 & 3 of *YS* with *Ant Attack* poster. Will pay £5 per issue if in good condition. Write to Paulo Cambraia, Est Benfica 523-4C, 1500 Lisboa, Portugal.
■ Back issue 7 of *YS* wanted. £5 offered. Tel. Nottm. 788285 and ask for Mr Worthington.
■ Very Urgent: I need two power supplies for an experiment for my 'O' Level science exam. Will pay £5 apiece. Contact Ian, 22 London Street, Andover, Hampshire SP10 2PE. Now!
■ Wanted *YS* issue 2, 3 and 7. Will pay £1.10 for each issue plus postage. Tel. (0792) 883246 and ask for Mr Thorpe.

» CLUBS & EVENTS

■ First Sinclair User Group established in Pakistan. Software and help can be exchanged. Membership open to all ZX Spectrum owners. Contact M Shah, K 11 Hasan Appts,. Hassan Square, Karachi 47, Pakistan.
■ Spectrum users club with monthly news page. Games, hints and tips. Tel. Aldershot (0252) 26905 (after 5 pm) and ask for David.
■ Spectrum book library. Send sae for details to P Lavender, 27 Min-Y-Coed, Radyr, Cardiff CF4 8AQ.
■ Finsbury Park. C'mon, anyone interested in forming a club in this area? Contact Peter Shaw (*Who he? Ed.*) at *YS* on 01-631 1433.

» PEN PALS

■ I am 15 and would like a pen pal who is learning or can program m/c and likes hacking. Male or Female. Write to Kerr Manson, 49 Newton Crescent, Dunblane, Perthshire FK15 0DZ.
■ Pen pal wanted, aged 17 upwards. Interested in games, adventures, programming, utilities and the Spectrum in general. I am 17. Ian Trout, 34 Alder Lane, Parbold, Wigan, Lancs, WN8 7NN.
■ Hi! My name is Haydn and I would like to swop ideas, programs, etc., with Spectrum, Commodores and Dragons in other countries. Haydn Barker, 24 Micklebring Lane, Braithwell, Rotherham, S Yorks. England.
■ Pen pal wanted, somebody who likes adventures, learning m/c, swopping games, hints and tips. Must be female aged 14 or over. Ian Haynes, 39 Bowyer Road, Abingdon, Oxon OX14 2EW.
■ I'm 15, hopeless at programming and can't complete *The Hobbit.* I would like to exchange hints and tips. Please write to Mike Palmer, 26 Caistor Close, Lordshill, Soton, Hants SO1 8GX.
■ I'm a 16 year old Aussie who would like to correspond with hackers and games freaks anywhere in the world. Other hobbies include cricket and reggae music. Bernard de Broglio, 85 Collins Road, St Ives, NSW 2075, Australia.
■ 13 to 15 year old penfriend wanted abroad, male or female, to swop ideas, tips, etc., and general correspondence — please contact Lee Cooper, 33 Mill Lane, Romsey, Hampshire, SO5 8EW, England.
■ Wanted: English pen pal, 11-13, Boy. Swop software, playing tips and POKEs. Would like information on how to do *Pyjamarama,* but not necessary. Tel. (0773) 710242 and ask for David.
■ Female pen pal needed to swop software, mags and info. Write to Graham, 2 Butter-bowl Garth, Leeds 12, Old Farnley, West Yorks. LS12 5BW.
■ Female pen pal wanted, 14+, to swop tapes etc. I'm 18 and ready to hear from you; please enclose photograph. Write to Richard Costall, 14 Morley Street, Market Harborough, Leics. LE16 9AU.
■ Wanted, 14+ year old female pen pal for exchange of tapes, etc. Into *LOM,* loud music, D+D and Anti-Commodore propaganda (*It ain't propoganda, it's all true. Ed.*). Potential victims write to Robert Stone, 'Vanda', Low Street, Carlton, Goole, North Humberside. DN14 9PA.
■ Pen pal wanted. I would like a person who has got *Everyone's a Wally* and other good games to share hints and POKEs. I am 14 years old. Tel. Basingstoke 54992 and ask for Shane Loving.
■ Pen pal wanted to swop games etc. I'm 13 and like golf, football and arcade computer software. Write to David Notman, 42 Baberton Crescent, Edinburgh EH14 5BP.

» MESSAGES

■ I have numbers 1-14 or *Your Spectrum.* Will sell together/separate or swop for Joystick interface or any four recent games. Write to R C Pancholi, 11 Coleford Road, Bolton, Lancs, BL1 4TS.
■ Issues 2 & 7 *YS,* with Ant Attack poster for sale. Send sae with offers of software/hardware or cash. Write to Manoj Bithal, 205 Brabazon Road, Heston, Middlesex TW5 9LW.
■ Here's a message to anyone who can convert *Ghostbusters, Knightlore, Underwurlde* to normal speed. Please write to Toni Lahtinen, Hursunuonkatu 7, 33730 Tampere, Finland.
■ Maps, POKEs and hints for many Spectrum games. Write to A Snelgar, 11 Deverells Wood Ave, Chandlersford, Eastleigh, Hants SO5 2AX.
■ Issue 1 and 2 of *YS* plus *Ant Attack* poster. Send offers. Also, wanted printer — dot matrix preferred. Tel. Winchester 51164.
■ Free biorhythm printouts. Send your date of birth and sae to M Chivers, 13 High Street, Crosskeys, Gwent NP1 7FR.
■ I have *YS* issues 2, 3 and 7. Send serious offers to David Guy, 187 Hollingdean Terrace, Brighton, E. Sussex, BN1 7HF.
■ Are you running low of ZX paper. Any quantity catered for. Only £2 a roll plus postage. For details write to G Edwards, 19, The Maltings, Hunton Bridge, King's Langley, Herts., WD4 8QL.
■ Poor, lonely 16 year old wizard who never has his hair cut, seeks to be left totally unhassled. Do not write to A Bramble, 40 Sherwood Place, Bonnyrigg, Midlothian, Scotland.

THE END OF



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The man behind *YS MegaBasic* — Mike Leaman.

KEY FEATURES OF YS MEGABASIC

- *An extended command set. YS **MegaBasic** recognises over 35 new commands, which allow you to access the new features available as well as providing the opportunity to make more of the commands in standard ZX Basic.*
- *64 columns of text. Useful for wordprocessing and database applications.*
- *Three character sizes. Using **YS MegaBasic**, you've now the choice of accessing double-height, standard and half-width characters.*
- *Three character fonts. **YS MegaBasic** offers three font styles which allow your Spectrum to mimic other machines on the market.*
- *Windows. You can manage up to six QL-style windows on-screen at any one time.*
- *Sprites. Using the free **Sprite Designer** package that accompanies each copy of **YS MegaBasic**, you'll be able to design and manipulate up to ten sprites on-screen at once!*
- *Enhanced sound. Mike Leaman's taken the Spectrum's BEEP command and given it the full Mega-treatment.*
- *Procedures. Structure your programs and define new commands — it's all here!*
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ZX BASIC?

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You can have up to ten sprites on-screen at any one time, but if you're careful with memory you can get more!



Here, *YS MegaBasic* is showing off its multifarious character sizes and fonts. Each window contains text in three different sizes: double height, normal height and that used for 64-columns; double height and standard text can be output in three different fonts.



The screen format for the input/output of *YS MegaBasic*. Three windows are provided for input, LISTing and RUNning programs; under software control, each window's size and purpose can be changed to suit individual requirements.

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Available only by mail order and only from
Your Spectrum

Your Spectrum, YS MegaBasic Offer, P.O. Box 320, London N21 2NB.

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That's right — by popular demand and for positively the last time ever, *YS MegaBasic* is on offer for the measly sum of £7.95. Yes, we know we've said it before — but from next month, *YS MegaBasic* goes on sale in high street shops at £9.95 and that's what you'll have to pay in *Your Spectrum.* So, don't delay — pay now and save yourself £2.

No longer will other machines kick sand in your user port — you'll have the Charles Atlas course specially designed for your Speccy.

HOW TO ORDER YS MEGABASIC

Just fill in the order form below, and send it off to *Your Spectrum, YS MegaBasic Offer,* Sportscene Specialist Press, 14 Rathbone Place, London W1P 1DE. For each copy of *YS MegaBasic* you'll need to send a cheque/Postal Order for £7.95 made payable to Sportscene Specialist Press.

But hurry this is positively, definitely, absolutely your ultimate, final and last (*put the dictionary away. Ed.*) chance to transform your Spectrum into a MegaSpectrum for just £7.95.

Your Spectrum, YS MegaBasic Offer, P.O. Box 320, London N21 2NB.

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HACK-FREE ZONE

Given a hacker a good poke recently? — literally and right between the eyes. If you play games for the challenge and not 'cos you want the infinite cheat POKE, then this is the page for you!

C'mon all you games players — you're not alone. Already many of you have come out into the open to prove that there's no game that can't be cracked without resorting to POKEs.

Who'd have thought, for instance, that anyone could possibly rescue all twenty-two rooms of cryonaughts in *Alien 8?* Well, **Carl Parkin**'s done it and he sent us a shot of the final screen to prove it. He reckons the best method is the obvious one — keep a rough map of everywhere you go and try to keep three objects with you at all times. You'll also need unlimited patience, plenty of time and an understanding family.

Still on the Ultimate challengers, **Ian Pullen**'s got the measure of *Knightlore.* His news is that you need to put fourteen items in the cauldron and it doesn't matter how many rooms you visit in the castle.

Alan White from Poole may not be the first to finish *Dragontorc* (see this month's Frontlines) but his knowledge of the game is encyclopaedic — he sent us a thirteen page hint sheet! This month though there's only room for one cryptic message:

Do not kill the hand,
Find something in the South,
That comes from the far East,
To use in the West.

Err, cheers Alan. Ummm, I'm sure they'll be letting you out soon.

Our challenge still stands. Let us know as soon as you've finished a game that everyone else reckoned was impossible. But remember, hackers, you know where you can stick your POKEs!

I've done it! (Cries of Yippeee!) Though they said it couldn't be done, I finished the following game(s) and there wasn't a POKE in sight.

....

My name is..

Address...

....

.... Postcode ....

Here are some of my hints'n'tips:

....

....

....

....

It's all true. With my own eyes I saw him/her do it.

Signed ....

ROCKY HORROR STRUCK

Our very own Riff-Raff,* Peter Shaw *settles down in his stall seat for the opening performance of* The Rocky Horror Show *from* CRL. *Be there for a bit of audience participation . . .

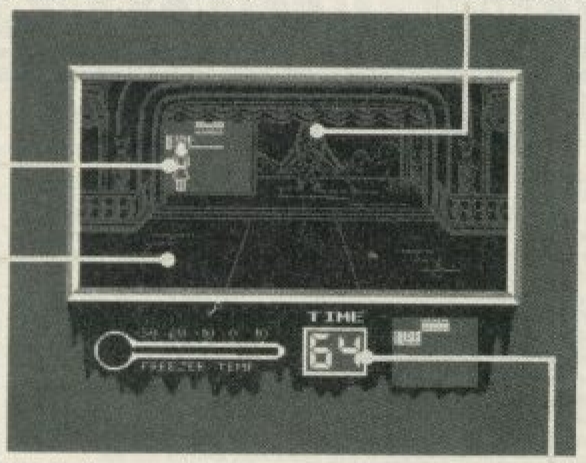
"Oh Brad, what have they done to you? An hour ago you were plain old Brad Majors, and now — now you're nothing more than a stone figure.

"Oh, if only we hadn't made this journey . . ."
But you did!
"If only the car hadn't broken down . . ."
But it did!
"If only we were amongst friends."
Two outa three ain't bad!

And that about sums up any semblance of plot the game might have. Now it's up to you to save Brad and his girlfriend Janet from a fate worse than working on *YS* . . .

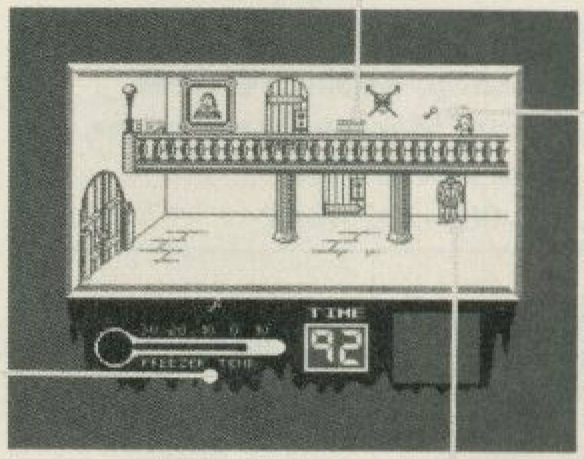
This is you playing the part of Janet Weiss (Dammit, Janet!) who's innocently stumbled upon this eccentric enclave. At the start of the game, you're given the choice of playing Janet or her boyfriend, Brad Majors.

The stage is hidden behind the curtain — it's here that you have to deposit each part of the De-Medusa machine as you collect it. You have until the clock runs out and then the whole household is transported up to Frank's home planet. By the way, don't ask what Brad's doing, 'cos you wouldn't want to know!



This is the freezer temperature — once it cracks the 0°C mark, the crazed Roger Willis look-alike, Eddie, will be out on the rampage in his souped-up C5.

Here's one part of the De-Medusa machine that Dr Frank'n'Furter's scattered around Frankenstein Place for you to seek out. It's the only way of bringing your beloved back from the stone-dead. Only when they're all in the bag can you make good your escape.



These keys are dotted all over the castle and, guess what you use them for? — yep, opening doors. Watch out though, 'cos you can only carry one at a time, so try to make a note of their position as you spot each one.

Riff-Raff, the paranoid manservant (*Where is he then? Ed.*), wanders about this area firing his laser in a most erratic fashion — well, you wouldn't expect anything to be logical. Get in the way of the laser beam and you've bought it! After all, the laser is made from pure anti-matter. (*Shriek from the back!*)

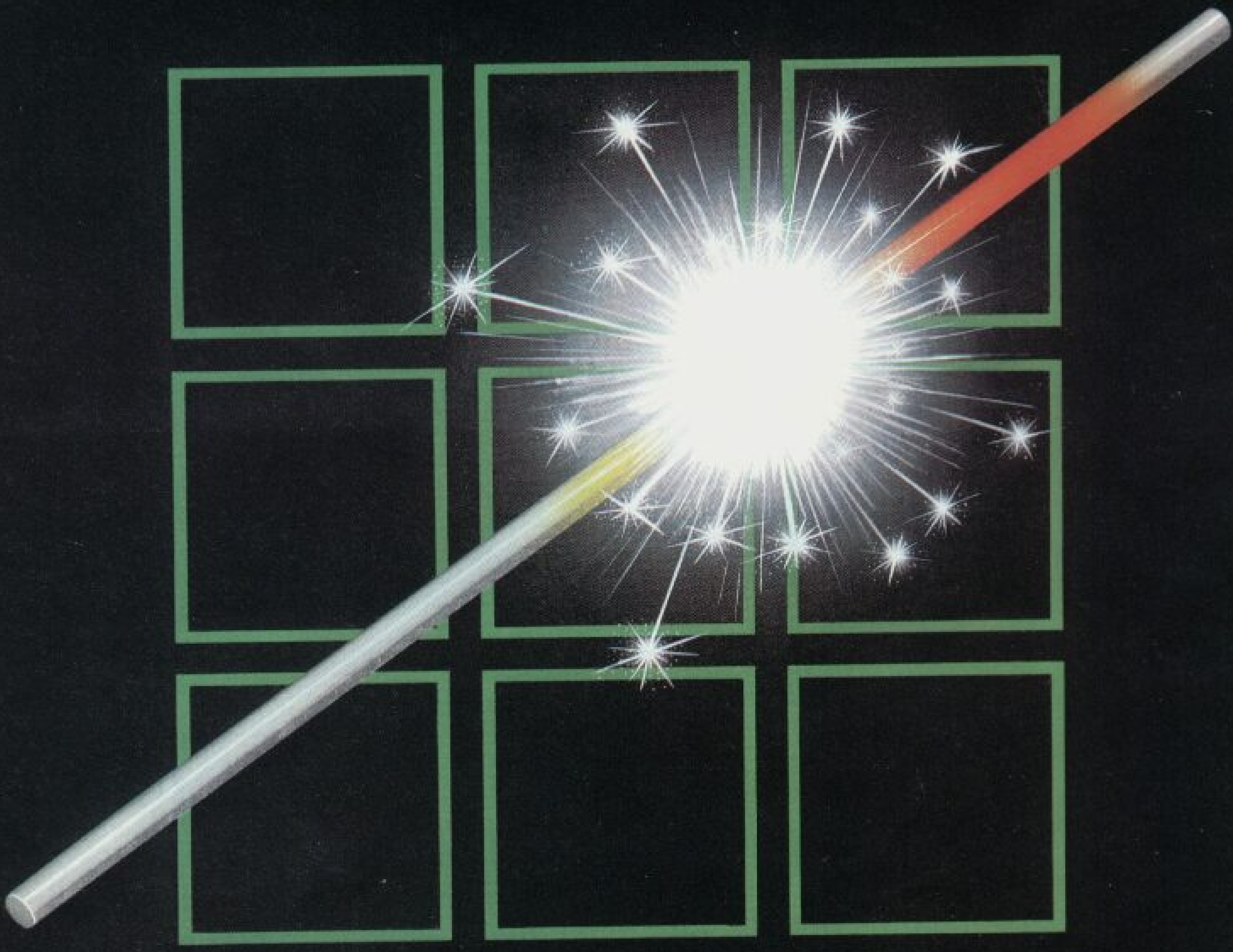
Keep an eye on this counter — when it reaches zero you've got zilcho chance of rescuing your loved one as the whole house lifts off.

Talk to the natives — some of them are friendly. It's just a question of sussing out which ones. You can usually trust Columbia, but watch out for the rest. Be careful of Eddie (*The geezer from the freezer!*) as he comes throttlin' through on his motorbike.

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